THE

CYCLOPÆDIA;

or,

Universal Dictionary

of

ARTS, SCIENCES, AND LITERATURE.

VOL. VI.
THE

CYCLOPÆDIA;

OR,

UNIVERSAL DICTIONARY

OF

Arts, Sciences, and Literature.

BY


WITH THE ASSISTANCE OF

EMINENT PROFESSIONAL GENTLEMEN.

ILLUSTRATED WITH NUMEROUS ENGRAVINGS,

BY THE MOST DISTINGUISHED ARTISTS.

IN THIRTY-NINE VOLUMES.

VOL. VI.

LONDON:

Printed for LONGMAN, HURST, REES, ORME, & BROWN, Paternoster-Row;

F. G. AND J. RIVINGTON, A. STRAHAN, PAYNE AND FOSs, SCATCHERD AND LETTERMAN, J. CUTHELL,

CLARKE AND SONS; LACKINGTON HUGHES HARDING MAVOR AND JONES, J. AND A. ARCH,

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J. DICKINSON, J. PATERSON, E. WHITESIDE, WILSON AND SONS, AND BRODIE AND DOWDING.

1819.
Cyclopaedia: 
Or, A New Universal Dictionary of Arts and Sciences.

Calvary.

Calvary, or Golgotha, in Ancient Geography, a mountain of Palestine, held in the greatest veneration as the scene of our Saviour's crucifixion. It acquired these two names, probably, from its roundness, or resemblance to a human skull, or, as others say, from its being bare and destitute of verdure. Theophrastus says, that by a tradition descended from the fathers, Adam, (or as others say, Adam's head) was buried here, and therefore, says he, Christ, who was to heal the fall and death of Adam, was here crucified, that where the beginning of death was, there might be the dissolution of it. The witnesses of this tradition adduced by Theophrastus are Origen, Tertullian, Epiphanius, Athanasius, and St. Augustine. St. Jerome observes, that this is a favourable interpretation, and pleasing to the ears of the people; but not true. It anciently stood without the walls of the city of Jerusalem, and was the place where criminals were executed according to the Mosaic law. But the Roman emperor Adrian having ordered the city to be re-built a little to the north of its former situation, Mount Calvary was enclosed within the walls. See Ἠλία Καπηλία. This mountain was cleared by order of Helena, the mother of Constantine; and fitted for the foundation of a church by cutting down several parts of the rock and elevating others. But this was done with so much care, that no part of the hill which immediately related to our Saviour's passion was altered or diminished. Accordingly that part of Calvary, where it is said Christ was fastened to the cross, is left entire; being about 10 or 12 yards square. The magnificent church erected on this spot by order of Helena was, therefore, built in such a manner as to comprehend as many scenes of our Saviour's sufferings as could be conveniently enclosed. This stately edifice is still standing, and kept in good repair, by the offerings of the pilgrims, who annually resort to it, as well as the contribution of several Christian princes. It is 100 paces long, and 60 wide; the walls of it are of stone, the roof of cedar; the east end encloses Mount Calvary, and the west comprehends the holy sepulchre. The former is covered with a noble cupola, supported by 16 massive columns, which were encrusted with marble. The centre of it is open on the top just over the sepulchre; and above the high altar at the east end is another fixedly dome. The nave of the church constitutes the choir, and in the side aisles are the places where the most remarkable circumstances of Christ's passion were transacted, together with the tombs of Godfrey and Baldwin, the two first Christian kings of Jerusalem. An ascent of 22 steps leads to a chapel, where that part of Calvary is shewn on which Christ was crucified, and the very hole in the rock, in which his cross was fixed. The altar hath three croffes in it, and is richly adorned with other costly embellishments, particularly with 46 silver lamps of immense value, that hang before it and are kept constantly burning. Adjoining to this is another small chapel, fronting the body of the church. At the west end is that of the sepulchre, which is hewn out of the solid rock, and has a small dome or lantern, supported by pillars of porphyry. The cloister round the sepulchre is divided into many chapels, appropriated to the several sects of Christians, who used to reside there, such as the Latins, Greeks, Syrians, Armenians, Abyssines, Georgians, Netherians, Cophtites, Maronites, &c. But these, say Maundrell, except four, viz. the Latins, Greeks, Armenians, and Cophtites, have abandoned their quarters, not being able to sustain the severe rents and exxtortions, which their Turkish landlords impose upon them. The apartments of the Latins are on the north-west; to them belongs the care of the church, and they
they make every day a solemn procession, with tapers and crucifixes, and other ceremonies, to the several sanctuaries of the church. Accordingly they are obliged to reside constantly in it; the Turk keeping the keys, and not suffering any of them to go out, but obliging them to receive their provisions through a wicket. E'en is the time at which the chief ceremonies are performed within this place; and these chiefly consist in representations of Christ's passion, crucifixion, death, and resurrection. At this solemnity, every pilgrim, paying a certain fee, is admitted to attend at the solemn procession and other ceremonies: of these there is commonly a vast concourse. Some of them choose to enter on Good-Friday, and stay till Easter-Monday.

Calvary, a term used in catholic countries for a kind of chapel of devotion, raised on a hillock near a city; in memory of the place where Jesus Christ was crucified near Jerusalem. Such is the Calvary of St. Valerian, near Paris; which is accompanied with several little chapels, in each whereof is represented in sculpture one of the mysteries of the Passion.

Calvary, in Heraldry, a crose le called, because it resembles that on which our Saviour suffered: it is always set upon fleps.

Calido Islands, in Geography, lie to the S.E. of Porroo island in the Exit Indies; a little to the S. of E. from cape Salatan, and to the W. of S. from Laut island.

Calcula, in Ancient Geography, a small town of Spain, placed by Piny and Polomy in the department of Hifpalis.

Calveluzo, in Geography, a town of Naples, in the province of Basilicata; 10 miles S. of Potenza.

Calvensano, a town of Italy, in the duchy of Milan, feated on the Adda.

Calventuras, a small island in the bay of Bengal, near the coast of Ava. N. lat. 10° 54'. E. long. 95° 20'.

Calvert, George, in Biography, baron of Baltimore, founder of the province of Maryland in North America, was the descendent of a noble family in Flanders, and born at Kipling in Yorkshire in 1582. After finishing his education at Oxford he became secretary to Sir Robert Cecil, in the reign of James I. by whose favour he was made clerk of the privy-council, and received the honour of knighthood. In 1619 he was appointed one of the principal secretaries of state; but though he discharged the office with great fidelity and diligence, he resigned it in 1624, honoursly confessing to the king that he was become a convert to the Roman Catholic religion. He was continued, however, a member of the privy-council during this reign, and in 1625 created baron of Baltimore in the kingdom of Ireland, at which time he represented the university of Oxford in parliament. Having been constituted by patent, during his secretarihip, proprietor of a province in Newfoundland, he named it "Avalon," and expended upon it a large sum. But though he twice visited it in person, and refused it from a French invasion, he at length abandoned it, and obtained from Charles I. a patent for the full property of the district since called Maryland. This he settled, and in his dealings with the natives displayed as much justice and good faith as William Penn did in his settlement of Pennsylvania. He likewise established a most liberal code of religious toleration in his province, so that it became not only the resort of a great number of Roman Catholic gentlemen, who first accompanied the founder, but also an asylum for many Quakers and others, who were persecuted by the bigotry of the puritans in New England. Lord Baltimore, who appears in all respects to have been a man of worth and found undertaking, died at London in 1632. Biog. Brit. See Maryland.

Calvert, in Geography, a county of Maryland, in the United States of America, on the western shore of the Chesapeake; about 32 miles long, and narrow.

Calvert's Island, an island in the North Pacific ocean, near the west coast of North America. N. lat. 54° 40'. W. long. 13° 10'.

Calvi, a town of Naples, in the province of Lavora, the fee of a bishop, suffragan of Capua; 5 miles N. of Capua, and not far from the sea. N. lat. 41° 17'. E. long. 14° 45'.

Calvi, a town on the west side of the island of Corfica, the principal place of a district in the French department of Golo, containing 8,515 inhabitants. It is situated on a promontory which advances into the sea, and forms one of the most beautiful harbours in the island, called "the gulf of Calvi." It is defended by a citadel on a rock with 5 battlements; distant about 11 leagues W.S.W. of Bastia. N. lat. 42° 20'. E. long. 9° 7'.

Calviello, a town of Naples, in the province of Basilicata; 12 miles S.S.E. of Potenza.

Calvin, John, in Biography, an eminent reformer, entitled on account of his talents and character, as well as his peculiar activity and zeal, to the second rank of celebrity among those who contributed to rescue the Christian church from the errors and superstitions of Popery, was born of an obscure family, named Cauvin at Noyau, in Picardy, in 1509. As he was originally designed for the church, he obtained at an early age a benefice in the cathedral church of his native place, and also the cure of Pont-l'Evêque. Having pursued the study of polite literature for some time at Paris, where he distinguished himself by his proficiency, and where he also acquired a predilection in favour of the new opinions in religion, from a study of the Scriptures, recommended to him by Robert Olivetan, he determined to change his profissional deification; and applied to the study of the civil law, first at Orleans, and afterwards at Bourges. The Scriptures were likewise the objects of his particular attention; the more he acquainted himself with these purest sources of theological knowledge, the more was he confirmed in the opinions he had adopted; and his attachment to them was strengthened by intercourse with Melchior Wolmar, a German professor of the Greek language at Bourges. Upon his father's death he was obliged to return to Noyau, where he resigned his ecclesiastical benefices; and soon after removing to Paris, he published, in 1534, an eloquent Latin commentary on Seneca's tracts "De Clementia," on clemency. In the title of this book he latinized his name Cauin into Calvinus, whence he afterwards assumed his common appellation of Calvin. His attachment to the reformation being now generally known, he was under a necessity of suddenly quitting Paris, and of retiring to Angouleme, where he obtained a sufficiency by teaching Greek. Here he was admitted into the house of Lewis du Tillet, canon of the church, whom he had prophesied to the reformed religion; and during his residence in this place he wrote the greatest part of his "Institutes." Notwithstanding his degree of protection which was afforded him by the queen of Navarre, he thought it most prudent to leave France, and in 1534 he withdrew to Basle, and in the following year published his celebrated work, entitled "Institutes of the Christian Religion." The design of this work was to exhibit a just view of the principles of the reformed, and to prevent their being confounded with the Anabaptists and other enthusiasts. It was addressed to Francis I. by a dedicatory epistle, which is much applauded as the finest specimen of modern Latinity, and which was intended to soften
CALVIN.

often the unrelenting fury of that prince against the Protestants. This work has been always much admired by persons of similar sentiments, for the elegance of its style, the peculiar excellency of its method, and the force of its reasoning. It passed through several editions, which were successively enlarged and improved; it was translated by Calvin into French; and versions of it were made in all the principal modern languages. To some editions is prefixed the device of a flaming sword, with the motto, "Non venit nitro sacram fed gladium," i.e. "I came not to send peace, but a sword." After the publication of this work, Calvin went to Italy for the purpose of visiting the duchies of Ferrara, who was a convert to the reformed religion, and who received him with great kindness. On his return to France, he proposed to pursue his journey to Strasbourg or Bâle; but being obliged, on account of the wars then prevalent, to pass through the territories of the duchy of Savoy, he took Geneva in his way; and being urged by the prevailing solicitation of Farel, Viret, and other zealous reformers, to settle in that city, he accepted the offices of preacher and professor of divinity, which were conferred upon him with the consent of the people, by the consistory and magistrates. This settlement took place in 1536. In the following year he began to display his arbitrary spirit, by obliterating all the people to swear solemnly to a body of doctrines, which also contained a renunciation of popery; and by refusing to celebrate the Lord's supper, till certain irregularities that subsisted in the church at Geneva were rectified. He also declared, that he could not submit to the regulations, which had been lately made by the Synod of the canton of Berne, and which required the use of unleavened bread in the eucharist, the baptismal fonts which had been removed out of the churches, and the feals, which had been abolished, to be restored at Geneva. This occasioned a conflict, which terminated in an order of the assembly of the people, summoned by the syndics, that Calvin, Farel, and another minister, should leave the city within two days. Calvin retired to Strasbourg, where he was allowed to found a church according to his own model. There he married a wife; and published his "Commentary upon the Epistle to the Romans." During his absence, his friends at Geneva were very anxious for his return; and they at length prevailed, so that he arrived thither in September, 1541. After his re-settlement he began with establishing a form of ecclesiastical discipline, and a consistorial jurisdiction, invested with full powers to inflict all kinds of censures and canonical punishments, as far as excommunication. See CALVINISM. This establishment was much disapproved by several persons, who expressed their apprehensions, that papal tyranny would soon be revived. Calvin, however, was inflexible; and on all occasions artfully the rights of the consistory, of which he was perpetual presbyter, as he also was of the assembly of the clergy. But fully apprized of the exorbitant power which accrued from this office, he advised, on his death-bed, that no person should again be invested with such authority; and after his time the office of presbyter ceased to be perpetual.

Such was the extent of Calvin's ambition and views, that he formed a project of making the republic of Geneva the mother and father of all the reformed churches, as Wittenberg was of the Lutheran. From hence ministers were to be deputed to diffuse and support the Protestant cause throughout the world. Here he designed to originate an uniform model of doctrine and discipline, and Geneva was to be as it were, the "Rome" of Protestantism. His plan was pursued with vigour and perseverance. An academy was instituted in this city, to which his own talents and learning, and those of his colleagues, Farel, and of other eminent persons, attached a degree of reputation that extended to all countries where the reformed cause had taken root. The breach of Calvin in his project was to prove that the Presbyterian model of church government would only hold a kind of divided empire with the Lutheran and Thomistic episcopacy. When Calvin had formed and established his system of doctrine and church government, (See CALVINISM,) he was too tenacious of his own opinion, and too arbitrary in the exercise of his authority, to allow any deviation or opposition among those to whom his influence extended. Of the invariable peculiarity of his character, tribulations occur under the articles BURLINGTON, BURBIL, and GENEVA; but that which entails the greatest charge on his memory was his treatment of SERVETUS. While he was passing through Geneva, in order to seek an asylum in Italy from the persecution of Roman Catholics, he was apprehended at the instigation of Calvin, tried on a charge of blasphemy, condemned, and committed to the flames. The mere statement of this fact is sufficient to expose it; and no apology can be devised to extenuate it, but such as arises from the intolerant spirit which generally prevailed, and which, for many ages, it was thought not only lawful but laudable to exercise against persons who were deemed to hold unscriptural and heretical opinions, conceived to be inconsistent with the unity of the church, and the safety of the civil state.

The course of Calvin's life comprehended a great variety of pastoral cares and literary labours; and it was terminated by sickness and labour at comparatively an early period, in May 1564, as he was nearly completing his 53d year. The character of this learned and active reformer has been Truthfully examined by various authors; and calumniated by various descriptions; and more especially by those of the church of Rome. But it is justly observed by a liberal and candid biographer, that, whilst his morals, in the ordinary sense of the term, appear to have been irreproachable, his chief faults consisted in a resemblance to those uncharitable persons who have confounded and traduced him. His extraordinary talents have been acknowledged by the most eminent persons of his age; and they were such as would have rendered him a distinguished scholar, if his attention had not been wholly, or at least principally, devoted to theological studies and ecclesiastical occupations. His writings are numerous. Besides his "Institutes," he published learned commentaries upon most of the books of the New Testament, and upon the prophets in the Old. He refrained from commenting on the books of Revelation, much to his praise, according to the judgment of Scaliger and Bodin, because he thought it imprudently obscure, and of dubious authority. Many zealous believers were offended by his applying to the temporal circumstances of the Jews several ancient prophecies that have been thought to refer to the Messiah, and to furnish arguments in confirmation of the Christian cause. In this respect, however, he thought for himself, and cherished the edification of fervent attachment to generally received opinions. To his other more elaborate works he added many controversial pieces; and all his treatises were collected in 1562, in 9 vols. folio. His opinions, which are now better known than his writings, have been the subjects of innumerable controversies. For an abridgment of them, see the next article. Gen. Dict. Malth. E. H. Vol. iv. Gen. Biog.

CALVINISM, the doctrine and sentiments of Calvin, and of his followers, with regard to matters of religion. Calvinism confounds its greatest purity in the city of Geneva; and from thence it was first propagated into Germany, France, the United Provinces, and England. In Germany,
Germany, we may reckon among its chief patrons, Frederick III., elector Palatine, who, in 1569, removed from their parochial functions, the Lutheran doctors, and filled their places with Calvinists; and, at the same time, obliged his subjects to embrace the tenets, rites, and institutions of the church of Geneva. This order was abrogated in 1576 by his son and successor Lewis, who restored Lutheranism; but in 1593, Calvinism was again restored, under the government of the elector John Calvin, and became triumphant. In France it was abolished by the revocation of the edict of Nantes, in 1685. It has been the prevailing religion in the United Provinces ever since the year 1578.

The theological system of Calvin was adopted, and was to the public rule of faith in England, under the reign of Edward VI.; and the church of Scotland was modelled by John Knox, the disciple of Calvin, agreeably to the doctrine, rites, and form of ecclesiastical government, established at Geneva. In England it has declined since the time of queen Elizabeth; though it still abounds, some free a lay allayed, in the articles of the established church; and in its rigour in Scotland. See Reformation, and Reformed Church.

The distinguishing theological tenets of Calvinism, as the term is now generally applied, respect the doctrines of Predestination, or particular election and reprobation, original sin, particular redemption, eternal, or, as some have called it, irresistible grace in regeneration, justification by faith, perseverance, and the Trinity. See each of these articles. See also Arminians.

Besides the doctrinal part of Calvin's system, which, so far as it differs from that of other reformers of the same period, principally regarded the absolute decree of God, whereby the future and eternal condition of the human race was determined out of mere sovereign pleasure and free will; it extended likewise to the discipline and government of the Christian church, the nature of the eucharist, and the qualification of those who were intitled to the participation of it. Calvin considered every church as a separate and independent body, inviolate with the power of legislation for itself. He proposed that it should be governed by prebendaries and synods, composed of clergy and laity, without bishops, or any clerical subordination; and maintained, that the province of the civil magistrate extended only to its protection and outward accommodation. In order to facilitate an union with the Lutheran church, he acknowledged a real, though spiritual, presence of Christ in the eucharist, that true Christians were united to the man Christ in this ordinance, and that divine grace was conferred upon them, and sealed to them, in the celebration of it; and he confined the privilege of communion to pious and regenerate believers. See Eucharist, &c. and Lutheranism.

In France the Calvinists are distinguished by the name of Hugonots; and, among the common people, by that of Parpaillots. In Germany they are confounded with the Lutherans, under the general title Protestant; only sometimes distinguished by the name Reformed.

Calvinists, crypta, a name given to the favourers of Calvinism in Saxony, on account of their secret attachment to the Genevan doctrine and discipline. Many of them suffered by the decrees of the convocation of Torgau, held in 1576. See Form of Concord.

The Calvinists in their progress have divided into various branches, or latter feils. CALVINO, cope, in Geography, is the most westerly cape of the Nicara, E. of Zante Island, and S.W. from the S. point of the extremity of the gulf of Lepanto.

CALVISANO, a town of the Brezian, belonging to the state of Venice; 12 miles S.S. E. of Brescia.

CALVISIANA, in Ancient Geography, a place of Sicily between Agrigentum and Hybla, on the route from Lilybaeum to Messina, according to the Itinerary of Arrian. M. d'Anville places it at a little distance N.W. of Gala, on the southern coast.

CALVISIUS, Sethus, or CALVITUS, in Biography, a German chronologer, was born at Groflhe, in Thuringia, in 1556, held the office of chantor at Leipsic, to which he was appointed in 1582, and died in 1615. His principal work was his "Opus Chronologicum," published at Frankfort in 1603, 4to. In the compilation of this work, he adopted chronological principles, and drew up astronomical tables, by means of which he fixed and compared different epochs. He also formed a system of chronology from the beginning of the world to his own time; in which he inferred the history of all ages, described by such circumstances, that even children might comprehend in their minds a continued series or synopsia of history. Scaliger speaks in terms of high commendation of this work, though the impression of it was for some time prohibited by the governors of the univeristy of Leipsic. However, John Kepler the celebrated mathematician, and other persons of his note, wrote against it. Calvisius published at Erford in 1616, in 4to, "Enotatio durum Quellionum, viz. circa Annus Nativitatis et Tempus Ministerii Christi," and in 1616, "Elencus Calendarii Gregoriani, et duplex Calendarii mellioris Forma," Franc. Marchiounum, 4to. In this "Elencus," he proposes two points; first, to explode the Gregorian calendar by the principles of astronomy, and next to point out a truer and more convenient form of a calendar. Calvisius is reckoned among the heretics of the first rank in the "Index Expurgatorius," published at Madrid in 1659. According to Walter, in his "Musical Lexicon," he was a very learned theorist, and good practical musician; of which he has left ample proofs to pohterity in his short treatise called "MELODIOIA, five Melodies condensata ratio, quam vulgo musicae poeticae vacant, ex versos fundamentum extra et explicata," 1592. This ingenious tract contains, though but a small duodecimo volume, all that was known at the time, concerning harmonics and practical music; as he has compressed into his little book the science of most of the best writers on the subject; to which he has added short compositions of his own, to illustrate their doctrines and precepts. With respect to composition, he not only gives examples of concords and discords and their use in combination, but little canons and fugues of almost every kind then known.

He composed, in 1615, the 150th psalm in twelve parts, for three choirs, as an Epithalumion on the nuptials of his friend Casper Anckelman, a merchant of Hamburg, and published it in folio at Leipsic, the same year. Several of his hymns and motets appear in a collection of Lutheran church music, published at Leipsic, 1618, in eight volumes 8to. under the following title: "Florilegium portens CXV. selectissimas Cantiones, 4. 5. 6. 7. 8. voc. praetaltillorum Auditorum." Some of these have had the curiosity to score, and have found the laws of harmony and fugue preserved inviolate. Gen. Dict. Burney's Hist. Mus. vol. iii.

CALVISSON, in Geography, a town of France, in the department of the Gard, half a league E. of Sommieres, and three S.W. of Nimes.

CALVITI, a town of Naples, in the province of Calabria. Citra: 1 miles E. of Carrat.

CALVITTS, E. or CALVITUS, in Geography. See BALDNESS.

CALUMET, in Modern History, a myric kind of pipe used by the American savages as the ensign of peace, and for religious fumigation. This is a symbol of friendship universal
universel among the people of North America, and the pre-
sentation of it is an usage of arbitrary imposition peculiar
to them. The acceptance of it is a token of concurrence
with the terms proposed; and the refusal as certain a
signal of rejection. When this pipe is offered, even in the
midst of the rage of a conflict, the weapons of hostility drop
instantly from their hands, and a truce ensues.

The calumet is a sort of tobacco-pipe, made of red, black,
or white marble. When they treat of war, the pipe and its
ornaments are commonly red. The flax is decorated
with round flakes, and locks of hair, or porcupines
quills: in it they smoke in honour of the sun. M. Laitan
will have it to be the original canopius of Mercury, of,
which used by the Greeks and Romans, with its wings
and its serpents, was only the copy.

The calumet is the symbol and security of traffic; by it
they pronounce life and death, peace and war: and they also
affix to it a power of raising the souls of the dead.

Among the Indians, there is also a totemic rite, called
the "dance of the calumet," which they perform on vari-
ous occasions. They are not allowed to wash themselves in
the rivers at the commencement of summer, nor to taste
the new fruits, without performing it; and the same ceremony
always confirms a peace, or precedes a war. In winter it is
performed in their cabins, and in winter in the open fields.

Having chosen a spot among trees, flanked from the best of
the sun, they lay in the middle of it a large mat, and set
upon it the monitor, or god, of the chief of the company.
On the right hand of this image, they place the calumet,
as their chief deity, creating around it a kind of trophy
with their arms. Those who are to fig on the occasion
take the most honourable seat under the shade of the trees.

When the company is arranged, each person, before he fits
down, sabates the monitor, by blowing upon it the smoke
of their tobacco; then every one in rotation receives the
kalumet, and holding it with both hands, dances to the
cadence of the vocal music, which is accompanied by the
beating of a sort of drum. During this exercise, he gives a
signal to one of their warriors, who, taking a bow, arrow,
and axe, out of the trophies above-mentioned, fights him;
whilst he defends himself with the calumet only; and both
of them continue the passime of dancing. When this
mock-engagement is concluded, he who holds the calumet
makes a speech, recounting the battles he has fought, and
the prisoners he has taken, and then receives a cloak, or
some other present, from the chief of the ball. He then
refuses the calumet to another; who, having acted a similar
part, delivers it to a third person; and thus in rotation, till
at last the instrument returns to the person who began the
ceremony; by whom it is presented to the nation invited to
the feast as a mark of friendship, and a confirmation of
their alliance, when this is the occasion of the entertain-
ment.

_**CALUMET, Grand, in Geography,**_ a portage of Lower
Canada, in North America, on the northern bank of the
river Utawas. This is the long-est carrying place on this
river, and is about two thousand and thirty-five paces. It
is a high hill or mountain. From the upper part of this
portage the current is forc'd, and is only a branch of the
Utawas river, which joins the main channel, that keeps a
more southern course, at the distance of 12 leagues.

Six leagues further it forms lake Coulange, which is about four leagues in length; from whence it pro-
cesses through the channels of the Allumettes to the port-
age, where part of the lading is taken out, and carried 342
paces. Then succeeds the portage des Allumettes, which
is but 25 paces, over a rock difficult of access, and at a
flatt distance from lake Coulange. From portage de
Choiies to this post is a fine deep hummock country, and
the land in many parts fit for cultivation. From hence the
river spreads wide, and is full of islands, with half a mile
for seven leagues, to the beginning of "River Skidas" or
long. 77° 16'. Mackenzie's Voyage, locd, p. 112.

**CALUMNY, the crime of accusing another falsely and
knowingly of some heinous offence.**

It is an ancient maxim, which experiences shows us to be
too well founded: _Adductor calumniius, sentor aliquid
heredit._

**Calumnny, oath of, Juramentum, or rather to juramentum
calumnie, among civilians and cartouche,was an oath in
which both parties in a cause were obliged to take; the plaintif-
that he did not bring his charge, and the defendant,
that he did not deny it, with a design to abuse each other, but
because they believed their cause was just and good; that
they would not deny the truth, nor create unnecessary
delays, nor offer the judge or evidence any gifts or bribes.
If the plaintiff refused this oath, the complaint or libel was
abandoned; if the defendant, it was taken _pro confesso._

This custom was taken from the ancient Athenian, who,
before they engaged, were to swear they had no malice, nor
would use any fraudulent or unfair means for overcoming
the other. The _juramentum calumnie_ is much diffused as a
great occasion of perjury. Anciently the advocates and proctors
also took this oath; but of late it is dispensed with, and
thought sufficient that they take it once for all at their first
admission to practice.

**Calumny, judicium, was an action brought against
the plaintiff in a court for a false and malicious accusa-
ation. When an accuser did not prove his charge, or seemed to have
sufficient or probable grounds for bringing any, the judges in
pronouncing sentence used the formula _calumniae, et
_which gave the defendant a right to bring an action of

calumny; the penalty of which was _fractia inuinio, or burning
on the forehead. See _Accusation._

**Calumny, in the Arts, was admirably personified by
Apelles. This celebrated painter was accused of having
conspired against Ptolemy, king of Egypt; and being deli-
ered from the danger that threatened him, he determined
to avenge himself of the calumny by a picture, which was
always held in high estimation. On the right was a man
with large cars, resembling Nidas; he stretched out
his hand towards Calumny, who approached him; and near
him were placed two female figures, those of Ignorance and
Difimence. On the other side stood Calumny, who was a
beautiful female, that appeared agitated and enraged; she
held in her left hand a flaming torch, and with her right she
dragged by the hair a youth, lifting his hands towards the
heavens, and calling the gods to witness in his favour. Be-
fore her moved a pale and deformed man, with piercing
eyes, who seemed to have just recovered from a long illness:
this was *Envoy.* Two other females, converted with Ca-
umny; those were Concealment and Deceit. Another fe-
male followed, clothed in black, with tattered garments,
which was *Repentance:* she turned her head backward,
difflved in tears, and looked with shame on Truth, who ap-
proached her. Lucian, in his _Dialogue against Calumny,_
has transmitted to us this model of moral allegory.

**CALVORD, in Geography, a town of Germany, in
the circle of Lower Saxony, and duchy of Magdeburg; 24
miles N.W. of Magdeburg.

**CALUPENA, in Ancient Geography, a country of Asia,
on the frontiers of the Lesser Armenia, and of the country of

_Landsena,
The name is derived from this circumstance, but it is not well chosen, as many plants which have the same character are not included under it.

It is also the seventh order of the fourteenth class in the system of Ventenat, where, though founded on the same general idea, it is still less comprehensive. Its genera are pappus, ginnos, lawna, lyrum, scianthera, perlonia, cuphea, fisudula, amaranth, glaxus, and pepisia. In all these the calyx is inferior, and the corolla, when present, is inserted upon the calyx and not within it.


Gen. Ch. Cal., perennial one-seeded, pitcher-shaped, deeply divided, segments numerous, linear-lanceolate, coloured. (Caducada, Vent.) Cor. petals numerous, flap-shaped, acuminate, attached to the calyx within its divisions, and exactly resembling them. Stema: twenty, much shorter than the petals; anthers oblong, cret., furrowed. Fil. germs numerous, superior: styles awl-shaped, compressed, the length of the flower; stigma glabrous. Per. none, except the bottom of the calyx, which thickens, becomes succulent, and takes the form of a berry. Seeds many, tailed.

Tiff. Ch. Calyx one-seeded, pitcher-shaped, with coloured segments. Petals resembling the segments of the calyx. Seeds many, tailed, within a succulent calyx.

Olf. Linnaus gives the flower no corolla, but a calyx with many divisions in two concentric ranks, all resembling petals; and Schöber and Mariy adopt his ideas. But we have preferred the description of La Mare and Ventenat, justified having observed, that the inner rank probably consists of petals; and Linnaus himself having, perhaps, incautiously, doublets inconsistently, admitted the true petals into both his specific characters. Sp. 1. C. floribusa, Carolina allspice. Linna. Sp. pt. 1, A. Mare. Iliff. Pl. 10. fig. 1. (Bateria, Dubam. Tab. 45.) Bateria, Mill. icon. 60. Dubam. Enret. Tab. 13. Frutex com: folia, Castell. Car. n. p. 46, Tab. 40.) "Petals longer than the divisions of the calyx." A shrub three or four feet high, or more in its native country. Stem irregularly branched, covered with a brown aromatic bark. Leaves opposite, pelted, egg-shaped, acute, entire, on short petioles. Stipules none. Flowers of a dusky purple colour, about an inch and a half or two inches in diameter; the petals incurved at the top; peduncles short, solitary, pubescent. A native of Carolina. Bofe affirms, from his personal observation in Carolina, that Linnaeus has confounded two distinct plants under one name. Both have opposite, egg-shaped, lanceolate leaves, without stipules, but tho' of one are pubescent and large, of the other, smooth and smaller; the flowers of the former are also larger, of a deeper red colour, and have a strong unpleasant smell, which tho' of the latter have not. Professor Martin mentions two varieties, the one with oblong, the other with roundish, egg-shaped leaves, but they do not correspond with Bose's two species, the latter of which does not appear to be known in England. The former was introduced into our gardens, by John Catesby, fo early as 1726. It will thrive in any soil, so planted in a warm situation and dry soil. It is propagated by laying down the young branches, which should be done in Autumn; in the spring twelvemonth after, the layers should be separated from the parent stock, and let where they are designed to remain.
remain. Some old tanners' bark should be laid on the
surface to keep out the frost while the plants are young.
Bole informs us, that the flowers and ends of the branches
influenced by brandy make a pleasant liquor, and that the seeds
are thought, in America, to be poissons to dogs and foxes.
2. C. Mares, in Linn. Sp. 2. M. M. 11. 44. 8. v. (Obel
or Roby, Kempf. Am. 1879. Tab. 8. 9.) "Petals shorter
than the divisions of the calyx." Leaves egg-shaped lance-
olate. Flowers appearing before the leaves, yellow; pet-
lals small, bristled with red spot. Fruit longer, silky
and rough. Seeds five or six, which form here their tail, and
red ribbed middle bead. A native of Japan and China,
introduced into England in 1774.
CALYCTERA, (from καλυτης, calyx, and ετος, a born.)
Wfillld. Cavan. ic. 4 p. 34. Tab. 338. Club and order,
fangenuia iegregea.
Eff. Cn. Common calyx, many leaved; proper calyx five-
toothed. Florets tubular, male and hermaphroditic.
Receptacle chalybe. Seeds naked.
Sp. C. herbaec. Root lusious. Stems a foot high, erect,
simple, smooth, round, hollow. Leaves linear-lanceolate,
pinnatind. toothed; stem ones nearly whole; radial ones
on long pediocks. Flowers compositd, globular, terminal;
barren and fertile florets intermixed; teeth, in the barren
florets, egg-shaped, acute, very short; in the fertile ones,
lanceolate-awl-shaped, twice the length of the corolla. Seed
flingle, naked, at the bottom of the calyx. Receptacle some-
what globular. A native of Chilii.
CALYCFLORE, a natural order formed by Linnaeus
for four genera, Olyrs, Trophis, Hippopata, and Elegannts;
but, as we learn from Giseke, afterwards abolished.
CALYCFLORUS in Zoology, a species of Brachице-
ous, first described by Baker in his Elays on the Micro-
cope, and since by Professor Pallas. It is defined by the
latter as being of a simple form, calyciferous, with the shell
crowned behind, and the upper lip of the mouth four-tooth-
ed. Invisible to the naked eye. Found in water.
CALYCFINA, in Entomology, a species of Ariansa,
the abdomen of which is globule, and of a pale, yellowish
\colour. The insect is thus described by Linnaeus in his Fauna
Suecia, as a Swedish species. Scoopoh calls it arenca Kley-
nii. This kind of idper secretes itself in the calyces
of flowers from which the corolla has fallen, and falls on
the flies that are tempted to the calyces in search of the
nectarious juices.
CALYCFISTAE, in Botany, a name given by Linnaeus
to those botanists who have arranged plants from a regard
chiefly or solely to their calyx. Magnoli and Linnaeus him-
selves are the only authors mentioned who have attempted
this method.
CALYCLE, a term invented by Vaillant to express a
series of leaves surrounding the base of the calyx, generally
shorter, of a different shape, and making a kind of doubt
causal; as in crepis, dianthus, malva, &c. Linnaeus in his Phy-
losophia Botanica calls such a calyx auctus; but in his prac-
tical works he is by no means uniform in his manner of ex-
pressing this circumference. In the Systema Naturae, he
describes the calyx of crepis and other kindred genera as caly-
ced; but in the Genera Plantarum he styles it sometimes
auctus and sometimes duplex or double. This latter term
he applies to the calyx of malva, &c. That of dianthus he
calls lecaly. The term is also used by Linnaeus to denote the
small permanent perianth which crowns the seed of icabola,
artotis, and some other genera, and is supponed, like the
down attached to the seed of molt fungenious plants, to
facilitate its dispersion. According to Gertner, a seed is
calyced when its crust is extended above its vertex, so as to
form a one-leaved cup; it is either entire as in tanacetum,
pyrethrum, dipkaeus, &c. or halved as in melampodium and
a few others. If there be more than one leaf it is considered
by him as a different kind of pappus to which he calls claply.
The term calylce is therefore employed by him with greater
rapidity than it is by Linnaeus. See his General Introducton,
p. 126.
CALYCOPTERIS, a generic name given to a shrub
figured by Lt. Mared in his Illustrations, which belongs to
the genus monyca of the Linnaean system. But there is
no article under that name in the alphabetical part of the
Encyclopedie; and as the letter-prefixed to the Illustrations
is not completed, we are not able to determine its proper
genetic character, nor of what country it is a native.
CALYDERMAC, (from καλυς, calyx, and δυνομε, a
flora) a genus formed by the author of the Flora Perma-
fis for the atom phylobates of Linnaeus, which came
the other species in having a dry five claded honey, and
a calyx with arrow-heart-shaped divisions, entering the
fruit.
CALYDNA INSECTA, in Ancient Geography, a single
island according to Steph. Byz. and Ptolemy; it is included
a group of islands, according to Homer, which Homer's place
them near the island of Rhodes. Some have thought that
this by this general appellation the poet designed to express the
Sporades. Strabo, in speaking of their honey, places them
near Tenedos; and M. D. anuille supposes, that they are
two rocks, which are still found, one before and the other
to the right of the port of Tenedos.
CALYDON, a city of Aetolia, pleasantly and commodi-
doniously seated on the river Euenus, which passed through it.
This city, which seems to have continued for some time the
repose of the ancient Aetolian kings, was built by Caly-
don, the son of Aetolus, from whence the kingdom was
called Calydon, though it afterwards resumed its ancient
appellation. Hercules came to this city after he had left
Peleponnesus; and though he had a numerous spurious brood,
scattered over all Greece, yet, desirous of legitimate issue,
his is said to have married Dejanira, the daughter of Cenus,
king of the country, and father to Meleager; and with a
view of ingratiating himself with the Aetolians, to have turned
the current of the river Achelous, or to have made such im-
provement in its channel, as to have given right to the fable
of his having vanquished it in single combat. Calydon was
fixed near the forest of that name, where Meleager, ac-
companied by the nobility youths of Greece, flew the famed
calidoscan boar. This fierce and monstrous animal had done
too much mischief in the neighbourhood, that Meleager, king
of the country, who kept his court at Calydon, was forced
to call to his assistance a great number of the most distin-
guished persons of Greece in order to destroy it. The chief
of these were Thefeus, Telamon, Peleus, Ptolus, and Iolus,
all of them the faithful companions of Hercules, besides a
number of other heroes. To these were added the famous
Arcadian princes Aralanta, who behaved with such uncommon
courage and intrepidity upon this occasion, that Mele-
ager became enamoured with her, and married her. If we
may credit Paunianus, (Arcad. cap. 46.) one of the tuffes
of this boar, which was preferred in the temple of Bacchus,
in the imperial gardens, was above a yard long, and there-
fore his size must have been very great. Some imperial
Greek medals were struck in the city of Calydon.
CALYMERE POINT, in Geography, lies on the southern
extremity of the east coast of the Carnatic country, in Hind-
doian, near N. gopadam. N. lat. 10° 20'. E. long. 79°
54' 30".
CALYMNA, in Ancient Geography, an island of the Me-
diterranean sea, upon the coast of Asia, before Carpathium,
according
according to Pliny. Oxid says, that it produced abundance of honey. It was one of the Sparoades, S.W. of Leros, and N.W. of Cos. See Calamo.

Calynda. See Calynda.

Calydara. Fiume Caffoli, a small river of Sicily, on the eastern coast.

Calyplectus. In Botany, from καλύπτει, a veil, from καλύπτω, to cover; a term used by old authors for that kind of veiling covering which invests the calyxes of mosses before they arrive at maturity. Linnaeus, who first took the capule for an author, considered it as a species of calyx. Hedwig at first regarded it as the corolla, but was afterwards convinced that it is properly part of the peltil, and that its first office is to strengthen the attachment of the flower to the stem. But as, from his own description, in its early state it invests the essential parts of the fructification, it is, as Linnaeus made it, properly a species of calyx. When the germ becomes enlarged, the calytra is torn all round from the base of the receptacle, and carried up by the capsule.


Gen. Char. Cal. perianth one-leaved, bell-shaped, truncate, without teeth, or very slightly four-toothed, inferior, permanent; covered before the time of flowering with a round, concave, deciduous operculum or lid. Cor. none. Stam. filaments numerous, capillary, inserted within the rim of the calyx; anthers roundish, double, filiform. Fil. germ roundish, flattened at the bottom of the calyx; style, simple, thread-shaped, inflexed, the length of the flowers; stigma obtuse. Peric. berry globose or oblong, crowned with the calyx. Seeds from one to four, somewhat angular.

Eif. Ch. Calyx superior, truncate, covered till the flaments and peltil become mature, with an entire deciduous lid. Corolla none. Berry one-celled. Seeds from one to four. Obs. It differs from Encalyptus in having a berry, not a capsule.

Species, 1. C. chryzaulea, Willd. Swartz. Prod. 79. Fl. ind. occ. 2. p. 991. (Myrtus chryzaulea, Linn. Sp. Chryzaulea, Brown Jam. 239. tab. 37. fig. 2.) "Peduncles terminal, panicled, trichotomous, downy; leaves egg-shaped, attenuated at the top." A tree. Leaves smooth, opposite. Lid flattened to the calyx laterally, but it afterwards turns back, and then the flowers come out, which before had been twilled and concealed. It is reckoned an excellent timber wood, but seldom exceeds 14 or 15 inches in diameter.


Obs. Prof. Martyn has adopted the idea of Schreber, in considering the Jambolofera of Linnaeus and the Calyptantes of Swartz as one genus, and has accordingly added the Jambolofera pedunculata of Linnaeus and the J. odorata and refinoa of Loureiro. Wildenow concurs with him, and has also adopted into this genus Eugenia Caryophyllifolia of La Maree. The genus Myrtus is a synonym. But as all these plants are expressly said to be furnished with petals, and as the frish three have only eight flaments, they cannot belong to Calyptantes, while its generic characters remain as they now stand. The genus Jambolofera in its own description, as its early state it invests the essential parts of the fructification, it is, as Linnaeus made it, properly a species of calyx. When the germ becomes enlarged, the calytra is torn all round from the base of the receptacle, and carried up by the capsule.


Gen. Char. Calyx treble, permanent; outer one confining of
of twoawl-shaped leaves; middle one with three egg-
shaped, acute divisons; inner one of two lanceolate
leaves. Cor. irregular; tube short; lower with five near-regular
segments; the two upper larger. Stam. four. Pfl. 
5 mm. superius, comp¬
plicated; style thread-shaped, declining,
the length of the filament; stigma capitate. Pet. capi¬
tate egg-shaped, two-celled, two-valved. Seeds numerous,
small, browned, flattened; receptacle fixed to the valves.
Eff. Chin. Calyx trilobed. An herbaceous plant, native of
Tenn.

CALYX, or Calyx, in a general sense, denotes a cur. 
See Chalice.

Calyx, in Ancient Aqueductis, denoted a braven module
or cup, put over a head or cædellum, to which pipes
were fitted.

Calyx, in Botany, καλύς, a covering, from καλυπτειν. 
The word is used by Greek writers for a rose bud, in which
the proper flower or corolla of modern botanists is not
opened, but lies concealed under an envelope. It is thus
explained by Suidas καλυπτειν, καλυπτειν μετακειν: the flower of
the rose not expanded. Aquila, full earier, in his version of Hesiod, 
ch. xxxv, 1. had translated the Hebrew word יַכַּלְעָא
καλύς, which, Jerom says, is a better rendering than יַכַּלְעָא
of the Septuagint, or phyllum of the Vulgate. Flurchit utullum, 
five ut significatius expressit Aquila, καλύς, quam nos 
tumentem rotundam, vnd pulivium foliis dilatatum, discere.
It shall flourish as a lily, or as Aquila more significantly
expresses it, as a calyx, or swelling role, whose flower-leaves
are not yet expanded.

By these writers the bud itself, in its entire sub¬
flance, is called a calyx: though the admission of στυρομοιαν,
by Suidas, as a synonym of καλυπτειν, may seem to imply only the en¬
velope, to which the term has been applied by modern bot¬
anists. According to Ray, it is the cape (folliculus) in
which, first the flower, and afterwards the seed of herbaceous
plants, and the fruit of trees is enclosed; but the latter
part of the definition must certainly be received, with
numerous exceptions.

Through a similarity in sound, and in many cases, a resem¬
blance in form, it was very early confounded with calix, a
cup; but as it is almost universally spelt with a y in the
latter syllable, its derivation and proper meaning cannot be dou¬
ted. It is the envelope cape of the cape, in which the tender
flower lies for a time concealed, and by which it is, in most
cases, afterwards supported and preserved.

Lammeus has followed Cæsalpinus in considering the calyx
as a prolongation of the cortex, or outer bark of the plant,
and has distinguished it into seven different kinds: 1. A pe¬
rianth, contiguous to the other parts of the fructification.
This is frequently called emplaiement or flower-cup by Eng¬
ish writers, and to it, as prof. Dr. Martin well observes,
should the term, cup, if admitted at all, be confined. 2. An
involute, remote from the flower, as in many umbelliferous
plants. 3. An amentum or catkin, from a common, chaffy,
gemmaceous receptacle. 4. A fathie burbling longitudi¬
inally. 5. A glume, formed of valves embracing the seed.
6. A calyptra, covering the capsels of molles like a hood.
7. A volva, a membranaceous covering to the fructification
of the fungi. See those words. The involucr is rather a number
of bractes; and the amentum, a species of inflores¬
cence.

Calyxhymenia. Ortega Decad. Bot. Flor. Peru-
Pl. 75. Clafs and order, triandra monocynia.

ate: border with free parted divisions. Stam. the 
Pfl., superius, comp¬
plicated; style curved; stigma capitate. Pet. capi¬
tate egg-shaped, one-styled, enclosed in the calyx.

Four species of this genus are figured in the Flor Par¬
vienca, which are all herbaceous plants with pointed faced,
and opposite, petioled, egg-shaped, entire leaves. They are
nearly allied to mirabilis: and according to Bell, from whom
we are obliged, not having the flora Parvienca at hand, to
translate this article, and what information, as usual, is muti¬
lated and unsatisfactory; there ought to be added to them
the mirabilis vicina of Camellia, which has been turned
into a distinct genus by Tuna, under the name of Thunbiana,
and by l'Héritier, under that of Oeytagus.

CaliZadera, in Geography, a town of Spain, in Old
Calistyle, once the seat of a bishop, united to that of Cala-
horra; 40 miles W. of Cadiz, N. lat. 42° 12'. W. long. 2° 47'.

CAME, or Grant, a river of England, which passes by
Cambridge, and joins the Ouse, three miles south from
Ely.

Cam, one of the smaller Virgin Islands in the West In¬
dies. N. lat. 18° 20'. W. long. 63° 25'.

Cam's Bank, lies on the coast of Planders, W. of the
Broer's bank, within which a ship may run through and
ride by the land in all winds.

CAMA, or Camila, in Ancient Geography, a town of
Asia in Armenia; the chief city of the Manichæists.

Camac, Porto, in Geography, lies on the north side
of the island of Canaria, to the S. of the Archipelago Islands,
and on the E. side of Cape St. John, having several islands
in its mouth.

Camacæ, and camae, in Ancient Geography, the de¬
nomination of distinct people, chieflie by Pliny among the
Seetian nations on this side of Mount Imnus.

Camæa, in Natural History, the name of a genus of
the semipellucid gems, the characters of which are these: 
they are obscurely transparent stones approaching to the
onyx structure, being composed of zones, and formed on a
crystalline base, but having their zones very broad and thick,
and laid alternately on one another with no other matter be¬
 tween them.

Of this genus we have four known species:

1. The dull-looking onyx, with brown black and white
zones. This is the camasa of the modern, and the Arabian
onyx. It is found in Egypt, Arabia, Persia, and the East
Indies. 2. The dull broad-zoned green and white camaca, or
the japhamcm of the Indians: it found in the East Indies,
and in some parts of America. 3. The hard camaca, with
brown white and chesnut-coloured veins. 4. The hard camaca
with bluish, white, and flesh-coloured broad veins, being the
fordaxon of Pliny's time, brought only from the East Indies.

Camah, in the Materia Medica, a name given by
Avicea and others to the large truffles found in the dearts
of Numidia, and many other parts of Africa, in great abun-
dance. These are white on the outside; the modern Afri¬
cans call them terento, and are very fond of them; they eat
them stewed with milk, water, and spices, and account them
wholesome and nutritious.

Camaiæv, or Camayev, in Mineralogy, a word used to
express a peculiar fort of onyx: allo by some to express a stone,
whereon are found various figures, and representations of land¬
ces, &c. formed by a kind of lyphs nature; so as to ex-
hbit pictures without painting. The word comes from
camaiævus, a name the Orientals give to the onyx, when
they find, in preparing it, another colour; thus expressing a se¬
cond stone. It is of these camaivus Pliny is to be understood
when

Camaleu is also applied by others to those precious stones, as onyxes, cornelins, and agats, whereas the lapidaries employ their art to aid nature, and perfect those representations. See Camal.

Camaleu is also frequently applied to any kind of gem, wherein figures may be engraved either indentedly, or in relief. In this sense the lapidaries of Paris are called in their latitudes enteres camameus. A society of learned men at Florence undertook to procure all the camas or camameu, and intaglios in the great duke's gallery, to be engraved; and began to draw the heads of divers emperors in camas.

Camaleu is also used for a painting, wherein there is only one colour; and where the lights and shadows are of gold, wrought on a golden or azure ground. When the ground is yellow, the French call it céruse; when grey, grisaille. This kind of work is chiefly used to represent ballo relievos: the Greeks call pieces of this sort μόριανα μορία.

Camail, in Ornithology, synonymous with cravatte, according to Buffon, and other French writers, the black-faced tanger of Latham, and tanagro atrum of Gmelin. This is a bird that inhabits Guiana, is about seven inches long, and of a cinereous colour, with the face, chin, and throat of the male black; and of the female, brown.

Camaines, Grand, in Geography, a large island, with low and smooth land, and trees on the top, about 46 or 48 leagues W.N.W. from the west point of Jamaica. The island is well forested with turtle.

Camaines, Little, are two islands, the westernmost of which is called Camin Brack. They lie E.N.E. about 20 leagues from the Grand Camanier. The people of Jamaica catch many turtles here.

Camala, or Camila, in Ancient Geography, a town of Spain, 24 miles from Lacobriga. Anton. Itin.

Camala, in Geography, a river that lies on the E. coast of Africa, within the long reef or sand bank from Cape Corinete to the Barra Vermelas, an extent of at least 400 miles.

Camaldulians, Camaldulians, of Camaldolites, in Ecclesiastical History, an order of religious, founded by Romuald, an Italian fanatic, in 1023; in the horrible desert of Camaldoli, otherwise called Campo-Malduli, situated in the state of Florence, on the Appenines.

Their rule is that of St. Benedict; and their houses, by the statutes, are never to be less than five leagues from cities. The Camaldulians have not borne that title from the beginning of their order; till the close of the eleventh century they were called Romualdias, from the name of their founder. Till that time Camaldulian was a particular name for thos of the desert Camaldoli; and D. Grandi observes, was not given to the whole order, in regard it was in this monastery that the order commenced, but because the regulation was well maintained here.

Guido Grandi, mathematician of the great duke of Tuscany, and a monk of this order, has published Camaldulian Diff stations on the origin and establishment of it.

The Camaldolites were distinguished into two classes, of which the one were Coenobites, and the other Eremites.

Camaldolunum, Camudulunum, or Comodunum, in Ancient Geography, a town of Albion, belonging to the Trinovantes, or Trinovantes. This town is placed by some of our antiquaries, as Talbot, Stillbrig, and Baxter, at Colchester; but by Camden, Horley, and others, more conformably to the itinerary of Antonine, and with greater probability, at Maldon. Dr. Cale earnestly contends for Walden. This was the capital of the powerful British king Cunobelin, and the first Roman colony in the island. Soon after the conquest of this part of the country by the Romans, a colony, confiding chiefly of the veterans of the 14th legion, was planted at Camulodunum by the emperor Claudius, A.D. 52; and by their wealth and industry, it became a place of great magnificence. But its prosperity was of no long duration; for it was quite destroyed by the Britons in their great revolt, A.D. 61. The theatre, the temple of Claudius, and the several villas in the neighbourhood, belonging to the Roman commanders, were totally demolished by the incensed Britons, who beheld the colony as a seat of slavery, that our learned antiquaries have been much divided about the place where it was situated.

Camamu, Río, in Geography, a large river of the Brazils, about 25 leagues to the southward of Bahia; on the banks of which are several small towns and villages, which are the seat inhabited of any part of the Brazils. There are not less than 3 or 400 small vessels employed by the inhabitants to convey their commodities to Bahia and Rio de Janeiro. The Jesuits formerly carried on a great traffic with this place, and sent a large frigate loaded from these parts to Paraguay. The source of this river is in the centre of the gold mines.

Camana, or Camane, in Ancient Geography, a town of India, on this side of the Ganges, in the gulf of Barga-zem; supposed by some to be situated in the place of the present Cambay.

Camana, in Geography, a town of South America, and capital of the jurisdiction of Camana in the diocese of Arequipa, in Peru, situated on a river of the same name, near the South Pacific ocean. The jurisdiction is large, and contains many deferts, especially along the coast. Eastward it extends to the borders of the Cordilleras, so that the temperature of some parts is nearly the same with that of Arequipa, while others are cold; and both produce similar grain and fruits. Its principal trade consists in textiles. It has silver mines in the mountains; but they are not worked. The town is 70 miles from Arequipa.

Camanar, a town that lies behind a ridge of rocks on the S. side of Gallipoli, on the Atlantic shore of the passage towards Constantinople and the Black sea.

Camanabaya, in Botany (Margraevae, and Petiver.) See Tillandsia ustulata.

Camantium, in Ancient Geography, the name of a town of Asia Minor, being, according to Athenaeus, one of the seven towns which Cyrus conferred on his friend Clearchus.

Camanusali, or Calcana Musali, in Biography, a physician and surgeon in much estimation, who practised at Bagdad about the middle of the 13th century. He wrote a treatise on the diseases of the eyes, in which he professes to have given all that could be found in the book Arabian, Hebrew, and Chaldæan writers on the subject; particularly he describes the method of curing cataracts by the use of feet. His work was translated from the Arabic into Latin, and published at Venice in folio with the Chirurgery of Guin de Caniac, who frequently cites him. The title of the tract is "De Pasionibus Oculorum Liber." It has been several times reprinted. Hailer. Bib. Chir.

Camara, in Botany (Plunier, Dillenius, La Marek, Boc.) See Lantana.

Camara, in Ancient Geography, a town of the island of Crete,
CAMARINA, in Geography, a town of Spain in Arragon; 4 miles S. of Tened.

CAMARINAS, a town of Spain, near the sea-coast of Galicia; 25 miles W.N.W. of Galicia.

CAMARINES, the south western province of the island of Luzon, one of the Philippines, in which are Bando, Paoaco, Ibanon, the metropolis of the government of Catanduanes, Bulan, Sefrocon, or Bagatan, where the king's ships are built, and Albo, a large bay without the fleet, in which there is a high burning mountain, seen at a great distance by the ships coming from New Spain, and possessing some springs of hot water. Beyond Albo, towards the coast, is the cape of Bumbyngay; and continuing from hence westward, we arrive at the river Bicol, which flows from a lake and runs by the city Caceres, the capital of the province. See Caceres.

CAMARINUM, or Camerino, now Camerino, in Ancient Geography, a town of Italy in Umbria, on the confines of Picenum, and at some distance from Nuceria. It was probably powerful, as the Romans. A. U. C. 144, solicited an alliance with it; they afterwards established a colony there. See Camerino. Strabo and Ptolemy.

CAMARICA, in Geography, a town of the island of Cuba; 15 miles E. of Havanna.

CAMARIPUGUACU, in Ichthyology, the name under which Maregraave, and various other old writers, describe the Brazilian species of Clupea, called by Broussat and Gmelin Cyprinoides: see that article.

CARARITE, in Ancient Geography, a people who inhabited the coast of the Capian sea, on the isle which separates that sea from the Euxine. Dioniysius Periegetes says, that they formed a numerous nation; and that they hospitably entertained Bacchus in his return from the Indian war.

CAMAROCENSIA CIVITAS. See Camaracum.

CAMARON, or Camarón, Cape, in Geography, a headland of North America, in the gulf of Honduras. N. lat. 15° 35'. W. long. 85° 29'.

CAMARONES, a town of the island of Cuba; 75 miles S.E. of Havanna.

CAMARONES, of Jamour, a river of Africa, which rises in the country of Bafrin, and passing through the territory of the Calbongos, discharges itself into the Atlantic in the gulf of Guinea. N. lat. 2° 28'. E. long. 11° 30'.

CAMARONES, Cape, is a headland at the mouth of this river.

CAMARONES, a river of South America, forming a bay in the Atlantic, about 50 leagues N. from Port Defile, or Defendo, and 20 from cape Blanco, which lies between them. S. lat. about 44° 32'. W. long. 66° 20'.

CAMARONES, a river of South America, on the coast of Peru, which runs into the Pacific ocean, about 36 miles S. of Arica. S. lat. about 19° 20'. It is 8 leagues N. from Pifagua river. There is a point or cape of the same name, rendered white by the dung of the cormorants, that refer to it.
CAMB, or KAMP, in Geography, a river of Austria, which rises on the frontiers of Bohemia, and discharges itself into the Danube.

CAMBADAS, a town of Spain, in Galicia, near the sea-coast; 4 leagues W. of Ponte-Vedra.

CAMBADENA, in Ancient Geography, a country of Asia; not far from Media. One of its principal towns was Baptana, seated on a mountain, in which were a column and statue of Semiramis.

CAMBAHEE, in Geography, a river of America, which runs into the sea near St. Helena's found, on the coast of South Carolina.

CAMBIA, in Ancient Geography, a place of Asia, in the Greater Armenia, and in the Hyperperid country, according to Strabo, who says that it had mines of gold.

CAMBALIDUS MONS, a mountain of Asia, which, according to Piny, was a branch of mount Caucasus.

CAMBALU, a name formerly given to Pekin, the present capital of China. In 1397, it was erected by pope Clement V. into an archbishopric, which he conferred upon John de Monte Corvino, an Italian friar, who had been employed for many years in propagating the gospel in that country. Upon his death in 1395, pope John XXII. sent Nicholas of Banter to fill the vacant see, and charged him with letters to the emperor of the Tartars, who was, at that time, in possession of the Chinese dominions.

CAMBAMBA, in Geography, a high mountain of Africa, giving name to the adjacent district, in the kingdom of Angula, on which is a mine of excellent silver. The Portuguese have been for a long time masters of it, and have built a strong fortress; which, on account of its vicinity to the river Cuamba, carries on a great commerce of slaves.

CAMBANA. See CAMBIA.

CAMBAT, a province of Abyssinia, dismembered from it by the Gallas. It occupies that district of Africa in the southern part of Abyssinia, which lies in about N. lat. 8°, and E. long. from about 37° to 38°. It is separated from Gingoro on the west and south-west, by the river Zeebe; on the north it has the kingdom of Hada, and other provinces of Abyssinia; on the east and south-east it has Buzamo and Alaba, and on the south Makoko. This country is frequently harassed by the Gallas; and it is said to pay some acknowledgments to the emperor of Abyssinia, which are only voluntary. But little certain is known concerning it. It is inhabited by a mixture of Christians, Mahometans, and Pagans; and abounds in various fruits.

CAMBAY, a large and beautiful city of Hindoostan, situated near the head of the gulf of the same name, upon the north bank of the river Canari, called by some the Mytic. The city is twice as large as Surat, but not nearly so populous: it is defended by a strong wall, about five miles in circumference; the streets are large, and have gates at their entrances, which are shut in the night, and there are 12 gates to the city besides those of the streets: the houses are built of stone, brick, or marble; and here are three bazaars, or public markets, and four public cisterns, which are capable of supplying the whole town with water in times of the greatest drought. This city is the port of Ameabhad, from which it is distant about 56 road miles. Its trade is carried on by Moorish, Armenian, and Arabian merchants, with Perfa, Mochia, Diu, Acheen, Coromandel, and other places; and it was formerly very great in spice, ivory, silk, cotton cloths, and other commodities. But its commerce has declined, and is chiefly transferred to Surat, on account of the inconvenient nature of the harbour, which is obstructed with sand and mud, so that in the highest tides it has not more than seven fathoms of water, and the
CAMBAYES, in Commerce, cotton cloths made at Bengal, Madras, and some other places on the coast of Coromandel. They are proper for the trade of Marfélles, whether the English at Madras send great numbers of them. Many are also imported into Holland.

CAMBAZA, in Geography, a town of Japan, in the province of Ikko-go.

CAMBE, la, a town of France, in the department of Calvados, and district of Bayeux; four leagues W.N.W. of Bayeux.

CAMBEJIO, a town of the island of Ceram, and principal market for cloves.

CAMBER-beam, in Building, a piece of timber cut arched, or with an obtuse angle in the middle, commonly used in platforms; as church-leads, and on other occasions, where long and strong beams are required. A camber-beam is much stronger than another of the same size; since being laid with the hollow side downwards, as they usually are, it represents a kind of arch.

CAMBERED-deck, in Ship-building. See DECK.

CAMBERG, in Geography, a town of Germany, in the circle of the Lower Rhine, and Lower Electorate; 22 miles N. from Mentsz, and 30 E. from Coblenz. It is situated in a prefecture of the same name; and the circumjacent tract contains fine arable land, but principally yields a good culture of flax.

CAMBERN, a town of France, in the department of the Channel; one league N.E. from Constances.

CAMBERT, in Biography, a French opera composer, previous to Lulli, has no place assigned him here as a great musician; but on account of his being connected, in some small degree, with the history of the opera at Paris, his name will frequently occur to our readers in perusing accounts of the origin of the musical drama in France. Cambert was the first who attempted to set an opera in the French language upon the Italian model, previous to the licence which he had obtained, being transferred to Lulli, who began his operatic career by composing the music for the dances. It being generally known that our monarch, Charles II., was very fond of French music and the amusements of Louis the fourteen's court, Cambert, in losing his privilege, came to London, and was appointed master of King Charles the second's band. His opera of "Pomone," written by P. Perrin, seems to have been performed in 1672 at court, in its original language, as no record of it occurs in our dramatic writers; but, according to Giles Jacob, his "Ariadne, or the Marriage of Bacchus," translated into English, "was presented by the academy of Musick, at the theatre royal, in Covent-Garden, 1674, by the gentlemen of the Academy of Musick." We know of no theatre royal in Covent-Garden at this time, nor do we meet with any mention of an English academy of music at this period. It is said, in the "Histoire de la Musique," tom. i., that Cambert, who died in London in 1677, broke his heart on account of the bad success of his operas in England.

CAMBETUM, in Ancient Geography, a town of Spain, placed by Ptolemy in the territory of the Luctianae, in the Tarragonens.

CAMPING, Boorong Campung, or Booring-volcr, in Ornithology, the name by which Martial, in his history of Numidia, distinguishes the great crane, ardea dubia of Gmelin, a bird of vast size that inhabits also India and Africa. It is specifically known by being of a plussen colour above, beneath dully white, and having the tail somewhat triangular. This is the largest or argil of lives.

CAMMINS, in Biography, an Italian instrumental composer, possessed of genius and fire. He is said by M. la Borde to be chiefly known to Dillilant. We suppose the violin to be his instrument, of which he seems to know the finger-board well, and to write with fancy and facility.

CAMBIO, an Italian word which signifies exchange; commonly used in Provence, and in some other countries, particularly Holland.

CAMBIST, a name given in France to those who trade in notes and bills of exchange. The word cambist, though a term of antiquity, is even now a technical word, of some use among merchants, traders, and bankers. Some derive it from the Latin cambium, or rather cambio.

CAMPBIA, in Vegetable Anatomy, a name that has been very happily bestowed by Duchamel and other physiologists upon the substane which is produced for the growth or repair of the vegetable body. The chief part of the cambium in the dycotyledons, or those plants with two feminal leaves, is between the bark and the wood. In order to observe it, we should select, in the full season of vegetation, a branch of some tree, in which the bark is known to be safely separable from the wood, such as the oifer, when upon detaching a portion of the bark, its inner surface, and that of the wood corresponding to it, will be found covered with a quantity of fluid which pollutes more tenacity than the common lymph or sap, and resembles mucilage or fluid jelly.

The cambium is generally reputed to be either an extravasation from the surface of the wood, or that of the bark, but it is not determined from which of these parts it is derived, or whether they are not equally competent to produce it. Mircbel supposes that the cambium is furnished by the wood, and with apparent foundation, since in the morocotyledons it is deposited around the ligneous fibres.

Grew and Duchamel did not allow this substance to be an extraramated juice, but believed that it polluted organization and distinct parts, although they were so soft as to evade all means of detection. Without deciding upon this opinion, we must admit that the cambium is not a fluid fluid, but must have received some modification to fit it for the important changes it is designed to undergo. As the secon advantage, this substance (when situated under the bark,) acquires solidity and visible organization, and is ultimately converted into the new layers of wood and bark, which are annually deposited upon dycotyledons. See BARK, CORTICAL LAYERS, LIBER, and Wood.

The gradual disappearance of the pith in many trees depends upon the formation of the cambium, or organizing fulbance within the medullary canal. This produces an internal liber, which is by degrees transformed into wood, in the same manner as the external liber gives origin to the external woody layers, except that in the former, the increase is outward, while in the latter, it is towards the center. See PITH, and MEDULLARY CANAL.

As the mode of growth in plants with one feminal leaf differs so materially from that of the dycotyledons, the cambium in them likewise holds a different situation. Instead of being deposited near the surface of the plant, it surrounds the ligneous fibres which occupy the interior, where it is converted
Thefe small is irrefour, it calendar, couple notorious, fertile, but well chile p. tho fe 40'. fad, and voyage by June. mouth.seatuary, a that tute the neccessary agulable menced of sequence nization. See MOCO. Gloff. beuty thature. been reputed, to his his lacuna. See Grafting. See England, France, Holland, and Flanders, are the chief places of this manufacture. Bruffils exceeds them all in the beauty and quality of its camblets; those of England have been reputed the second.

Camblets, figured, are those of one colour, whereon are stamped various figures, flowers, foliage, &c. by means of hot iron, which are a kind of moulds, piled together with the fluff under a press. These are chiefly brought from Amiens and Flanders: the commerce of these was anciently much more considerable than at present.

Camblets, scotter, those which, after weaving, receive certain preparation with water; and are afterwards passed under a hot-press, which gives them a smoothness and luflre.

Camblets, scotred, are those whereon waves are impreffed, as on tabbies; by means of a calendar, under which they are paffed and repaffed several times.

The manufacturers, &c. of camblets, are to take care they do not acquire any falle or needle's phaits; it being almoft impossible to get them out again. This is notorious, even to a proverb: we lay, a person is like camblet, he has taken his plait.

Cambnites lapis, in Mineralogy, a name given by the
don't is the Camboise gum, which yields a fine yellow tin. Ivory also, and silk, are very plentiful, and of little value. The gold of this country is said to be very pure; and it furnishes amethysts, hyacinths, rubies, topazes, and other precious stones. Cattle, particularly of the cow-kind, are numerous and cheap. Elephants, lions, tigers, and almost all the animals of the deserts of Africa, are found in Cambodia. It has several precious woods, among which are the sandal and eucalypt-wood, and a particular tree, in the juice of which they dip their arrows; and it is said, that though a wound from one of the arrows provokes fatal, the juice itself may be drunk without danger. The country, though fertile, is very thinly peopled, insomuch, that the king is hardly able to assemble 50,000 men; and its trade is considerable. The inhabitants are Japanese, Chinese, and Malays, together with some Portuguese, who live without priests, and have intermarried with the natives. The men are generally well made, of a dark yellow complexion, with long black hair; their dress is a long and loose robe; but the dress of the women, who are handsome, but not very modell, is shorter and closer. Their religion is idolatry. They manufacture very fine cloth, and the needle-work of the females is much admired.

CAMBONA, a small island in the Indian Sea, near the south coast of the island of Celebes. S. lat. 5° 22'. E. long. 128° 45'.

CAMBONES, a town of France, in the department of the Tarn, 7 miles E. of Cartres.

CAMBONUM, in Ancient Geography, a place of Gaul, to the left of the Rhine, in the route which passes from Dea Vocontionum (Dio), and Lucas Auguli towards Vapincum (Gap), in going by Mons Selecus.

CAMBORI, in Geography, a town of Asia, in the kingdom of Siam, on the frontiers of Pegu, seated on a small river which runs into the gulf of Siam.

CABORICUM, or CAMBORIUM, in Ancient Geography, a Briton station in the fifth route of Antonine's itinerary from London to Lugoalum in Carlisle, between Icianos and Duroliponte. All our antiquaries, except Mr. Horsey, fix Camboricum near Cambridge, at a place called by Bede, Gratianfeld, and derive its name from Cam, crooked, and Brit, a ford. Those antiquaries who place Camboricum at Cambridge, fix Duroliponte at Godmanchester.

CAMBRA, in Geography, a small town of Portugal, in Beira.

CAMBRASINES, in Commerce, fine linen made in Egypt, of which there is a considerable trade at Cairo, Alexandria, and Rosetta or Raphic. They are called cambra-fines, from their resemblance to cambrics.

CAMBRAY, in Geography, anciently Cambreacum, a city of France, and principal place of a district, in the department of the North, seated on the Scheldt, which divides it into the easter and wester parts, and fills its ditches with water. Before the revolution, it was the capital of Cambrésis, in the Low Countries, and the see of an archbishop, established in 579. The archbishop dyed himself prince of the Holy Roman Empire, and Count of Cambrésis, and he was also lord of the city. It is well fortifed, being defended by a strong citadel on the Scheldt, and a fort; and as the land is low on that side of the river, the adjacent parts may be laid under water by means of sluices. This city is large and tolerably handsome; its streets are spacious; the place or square for arms is so extensive as to be capable of receiving the whole garrison in order of battle. It has two collegiate churches, exclusive of the cathedral, which is dedicated to the virgin Mary, and one of the finest in Europe. The people is high, and from the top of it commands a view of the whole city. It contains ten parish churches, three abbeys, two convents, two hospitals, and several religious houses. Its principal manufactures are lace, soap, and leather; and particularly the fine linen, hence called cambre. The eastern division contains 66,000, and the western 74,000 inhabitants; the former contains 14,351, and the latter 14,443 inhabitants; the whole territory comprehends 1445 square miles, and 31 communes. Cambra is an ancient city, and was formerly imperial. It has been, on a variety of occasions, the subject of contests between the emperors, the kings of France, and the emirs of Flinders. In 1514 it was taken by the emperor Charles V. It was afterwards given to John of Montoube, by Henry III. of France, but besieged by the Spaniards in 1569, when the inhabitants compelled the governor to surrender. Ever since it continued under the dominion of the house of Austria till 1777, when it came into the possession of France. In August 1713, this city was invested and summoned to surrender by the Austrian general De Boves; the French general Derby returned for answer, that he did not understand surrendering, but he knew how to fight. In April, 1704, the French were defeated at Cefar's camp, in the neighbourhood, by the allied army under the command of the duke of York, with the loss of 1200 men, and three pieces of cannon; and the next day they left 1200 men dead on the field of battle, with the loss of their generals, Chapuy, 350 officers and privates taken prisoners, and 22 pieces of cannon. N. lat. 50° 10' 32'. E. long. 3° 13' 41'.

The league of Cambrai, in 1568, was the most singular event that occurs in the history of Europe. It was a confederacy, instigated by pope Julius II. and which gained the concurrence of the emperor Maximilian I., of Louis XII. of France, by the suggestion of cardinal d'Amboise, and of Ferdinando king of Spain, for the final overthrow of the republic of Venice. This league originated in resentment, and was diametrically opposite to the true interest of every one of the contracting powers. The republic of Venice had before this time acquired great power; but whatever were the means by which it had become thus powerful, it was now the bulwark of Italy; it prevented the pope from drawing the emperor or the king of the Romans, as he was then called, into Lombardy, against the French; it moderated the views of king Louis, and hindered him from extending his conquests; it kept the pope from being reduced to a state of dependency; and it preferred to Ferdinand the catholic the kingdom of Naples. Although it might have been the interest of each of these potentates, separately, to recover, if possible, what had been taken from them by the republic; yet, to oblige her to refund all her conquests was to reduce a power of which they were all afraid, and thus to open a source of perpetual wars among themselves. However, the league was formed; consisting of a variety of articles, advantageous to the several contracting parties, and threatening destruction to Venice. The execution of it was attended with all the successes that could be expected; for the emperor and the king of France wrested from the Venetians almost all the cities which they possessed in Lombardy; nor was the pope remiss in seizing all that lay convenient for his purpose. The Venetians, indeed, thought themselves so little able to withstand this powerful and formidable alliance, that they abandoned all the territories on the continent, after having loft the famous battle of Chiara d'Adda, in which their whole infantry was cut to pieces. However, after many humiliations and disfaters, they preferred their capital; and having either brought over, or bought over, the
pope, the rest of the confederacy was disjointed. The mea-
sures of the French and Germans, who were bent upon her
total ruin, were traversed by the king of Aragon and the
pope, who by no means concur in the utter destruction
of the only power which had hitherto hindered these
nations from subduing all Italy. The republic soon re-
covered a great part of her former territories; though she
was obliged to surrender to the pope Ravenna; to Spain,
the five towns which she had till this time possessed in Cala-
bria; and to the emperor, Triece and Triun.
CABREMER, a town of France, in the department of the
Calvados, and chief place of a canton, in the district of
Pont-l'Eveque; 5 leagues E. of Caen. The place con-
tains 1260, and the canton 10,118 inhabitants; the terri-
tory includes 105 kilometres, and 36 communes.
CAMBRÉSIS, GIRALDUS, in Biography, arch dea-
con, and afterwards, bishop of St. David's, was born about
the middle of the 12th century, and died after the year
1210. See GIRALDUS.

The account which this ancient prelate has given, in his
description of Wales, concerning the marvellous power which
the Cambro-Britons and the Northumbrians had, of finging
in parts spontaneously, at a time when counterpoint was un-
known in the rest of the world, not only merits notice here,
but some discussion. See CAMBRO-BRITISH AND NA-
TIONAL MUSIC. Many ecclesiastical historians tell us that the organ
was first admitted into the church at Rome by pope Vitalian,
666, the fame pontiff who two years after lent fingers into
Kent, to finish the work which Aulfin, the first Roman mi-
fionary, had begun. In 680, according to Bede, John,
the predecessor of St. Peter's in Rome, was lent over by pope
Agatho to instruct the monks of Wormer in the manner
of performing the ritual, who opened schools for teaching
music in other places of the kingdom of Northumberland.
This may reconcile to probability some part of the following
account, which Giraldus Cambrensis gives of the peculiar
manner of singing that was practised by the Welsh, and the
inhabitants of the north of England, about the end of the
twelfth century.

"The Britons," says he, "do not sing in unison, like
the inhabitants of other countries; but in many different
parts. So that when a company of singers among the com-
mon people meet to sing, as is usual in this country, as many
different parts are heard as there are performers, who all at
length unite in concourse, with organic sweetness. 4 In
unum denique fab B mollis dulcedine blandâ concomitant
organicae consonantia melodiam. 5 In the northern parts of
Great Britain, beyond the Humber, on the borders of York-
shire, the inhabitants use the same kind of symphonious har-
mony; except that they only sing in two parts, the one
murmuring in the base, and the other warbling in the acute
or treble. Nor do these two nations practise this kind of
singing so much by art as habit, which has rendered it so
natural to them, that neither in Wales, where they sing in
many parts, nor in the north of England, where they sing
in two parts, is a simple melody ever well sung. And, what
is still more wonderful, their children, as soon as they at-
tempt using their voices, sing in the same manner. But as
not all the English sing in this manner, but those only of
the north, I believe they had this art at first, like their
language, from the Danes and Norwegians, who used fre-
quently to invade and to occupy, for a long time together,
those parts of the island."

This extraordinary passage requires a comment. And
first, it may be necessary, before we reason upon the cir-
cumstances it contains, to be certain of their authenticity.
Giraldus Cambrensis is indeed an author who has been often
supposed inaccurate and fabulous. "Girald Cambrensis
deserves no manner of regard or credit to be given him; and
his Chronicle is the most partial representation of the Irish
history that ever was imposed on any nation in the world.
He has endeavoured to make the venerable antiquities of the
island a mere fable; and given occasion to the historians
that come after him, to abuse the world with the same fictitious
relations." Keating, part i. p. 13. Dr. Nichollon, Bishop of
Derry's, Irish Historical Library, 1st ed. Dublin, 1724.
The glaring improbabilities in the above account, with the
manifest ignorance of the subject in question, by no means
contribute to augment his credibility. For whoever is ac-
quainted with the laws of counterpoint, or with the first dif-
ficulties attending the practice of singing in parts, can have
no exalted idea of the harmony of an untaught crowd, tura
canzontes, or suppose it to be much better than the dissonant
noises of a good-humoured mob; in which the parts would be
as various as the pitch of voices of which their chorus
was composed. But how all these united at last in the con-
sonance of organic melody, and the soft sweetness of B mollis,
will long remain an impenetrable secret. If by organica
he meant organized, or harmonized, melodies, we
may suppose that the Cambro-Britons, in the time of Giral-
dus Cambrensis, had acquired some knowledge in diaphonic,
or consonant; which according to John of Salisbury, an elder
writer, was practised to great extent in the 12th century.
With respect to what he affords of the people in Northum-
berland finging in two parts, it is more reconcileable to pro-
bability, from the circumstances just mentioned, of the cul-
tivation of music in that part of the world under Roman
matters, who may probably have first brought over the art
of consonant, or double singning, which the newly invented
organ had fuggetted, by the facility it afforded of sounding
two or more notes at a time; which art, when practised by
voices, was thence called organum, organizzare. But as to
what Giraldus says of children naturally singng in this man-
ner as soon as they were out of the cradle, the reader will
afford it what degree of weight he pleaseth; for our own
part, we must own that it is not yet admitted into our
musical creed.

CAMBRESIS, in Geography, a province of France in the
Low Countries, before the revolution, bounded on the north
and east by Hainaut, on the south by Picardy, and on the
west by Artois. The length is about 10 French leagues, and
its breadth from 5 to 6, and in some parts from 2 to 3. It
is fruitful and populous, and watered by the Scheldt, Seille,
and Sambre. The principal towns are Cambrai, the capi-
tal, Chateau-Cambrai, Creveceur, Valenctin, and Van-
celles. Its inhabitants are laborious and lively, and addit-
ioned to the arts. Its commerce conflits chiefly in grain, sheep,
wool, and linen. Its pastures are excellent, particularly
for horses and sheep.

CAMBRETUM, in Ancient Geography, a British
station in the 9th route of Antonine's Itinerary, 15 miles
from Anfa or Witham in Essex. Mr. Camden and Dr.
Gale fix this station at Bretunham, on the river Bre-
ton; but Mr. Horsey thinks that the distance suits bet-
ter with Stratford, near the confuence of the Breton and
the Stowr.

CAMBRIA, a name given to the province of Wales be-
fore the time of Caesar's invasion, and retained by it till
about the clofe of the 6th century, when it took the ap-
pellation of Wales; and when the inhabitants, likewise, with
their ancient situation, lost the title of Britons, and became
distinguished by the name of Welsh. See WALES.

CAMBRIC, in Commerce, a species of linen made of flax,
very fine and white; the name of which was originally de-
vised
The manufacture of cambrian lawns has long since proved of extraordinarv advantage to France. For many years it appeared that England did not in this article contribute less than 200,000l. per annum to the interest of France. This proved motive sufficient to induce the parliament of Great Britain to enact many salutary laws to prevent this great loss of our wealth. See 18 Geo. II. c. 36. and 21 Geo. II. c. 36. See also Stat. 32 Geo. II. c. 32. and 4 Geo. III. c. 37. which regulates the cambrian manufacture, not long since introduced into Winchelsea in Sussex; but so soon abolished. The cambrians now allowed in this country are chiefly manufactured in Scotland and Ireland. Any person convicted of wearing, selling (except for exportation), or making up for hire any cambrian or French lawns, are liable to a penalty of 5l. by the two first flat rates cited above. The above cited statute, 4 Geo. III. c. 37. establishes the corporation of the English linen company for making cambrians and lawns, and enacts, that, whenever there shall be a manufactury of this kind, the commissioners of excise shall appoint the supervisor, or other officer, to seal the same; for which purpose notice shall be given by the manufacturer, before the piece is taken out of the loom, under penalty of 5l. and forfeiture of every such piece. This piece shall be marked and numbered, on pain of 10l.; and an officer marking any piece not made in England, or after it is taken out of the loom, shall forfeit 5l. and his office. Attempt to bribe an officer incurs a penalty of 50l., and the officer accepting it forfeits 100l. and incurs the punishment of the pillory. Cambrians and lawns, made in England, and found unlabeled, shall be forfeited, seized, and sold; and any person expelling such to faile, or having them in his custody for that purpose, shall forfeit 200l.; which goods shall be exported, and not relanded. To counterfeit the seal, or import any foreign cambrians or lawns with a counterfeit mark, or expose the same to sale, knowing the same to be counterfeited, is felony without benefit of clergy.

CAMBRIDGE, in Geography, is a large, and the principal town in a county of the same name in England. It is particularly noted in the annals of literature and science, for its university, which has been honoured with the residence of many persons of eminent and highly illustrious character, and provided for them the means of instruction. Concerning the priority of origin, and establishment, of this, and the charter university at Oxford, there has been much controversy with partial antiquaries. The original foundation of this town and university is involved in fabulous obscurity; and the stories that have been propagated by some of the monkish writers confute themselves by their own absurdity. Without repeating any of these fables, or tracing up the annals of Cambridge anterior to the Roman colonization of Britain, we will endeavour to elucidate this history briefly from that period. "The site of the Roman Granit" observes Dr. Stukeley, "is very traceable on the side of Cambridge towards the castle, on the north-west side of the river, of an irregular figure containing 30 acres, surrounded by a deep ditch, great part of which remains on the south-west, and in the grounds behind Magdalen college." Roman bricks, coins, urns, and paterns have been found near this spot, and in the vicinity. The villages of Chesterton and Grantchester, in the neighbourhood of Cambridge, have been considered by some antiquaries as occupying the sites of Roman flations or camps; and as preserving evidences of that in their present appellations. Other memorials of the Roman have been found in the military ways, or roads which diverged from the flation of Granit.

During the Anglo-Saxon dynasties, the town of Cambridge receiv'd but few grants, and those are merely of battle, figure, and other similar charters. The university, or rather a kind of academic institution, appears to have been first founded early in the tenth century, by Edw. earl of Cornwall, called Eadric. How long this institutio was not informed; but as Alfred complained that he could not find teachers when he had youth and home to be instructed, we may fairly presume that there were no public academies at that time. The model of emulous, or probably of founding the real university belonged to Edward the Elder, son of Alfred the Great, who appears in the chronicle of Hydendlake, to have erected "halls for the students, and chairs and books for the doctors, at his own charge." He also appointed professors, and adopted other necessary manners which seemed to secure the stability of the institution. In the year 1060 the town was fired, and plundered by the marauding Danes, who committed repeated depredations in this part of the island. At the time of the domeday survey, in the reign of William the Conqueror, it contained 373 homesteads, 27 of which were shortly afterwards removed to make room for the are erected by the Conqueror; or rather, as Fuller observes, "re-edified." In this fortress he soon afterwards received the submission of the monks of Ely, whose resistance to his power appears to have been the principal inducement for erecting it. In the reign of William Rufus, the town and county of Cambridge were ravaged with fire and sword by Roger de Montgomery, in revenge for an affront given him by the king. The university was therefore for some time abandoned, but Henry I. induced the wandering students to return, by investing the town with many valuable privileges. He exempted it from the power of the Sheriff in the year 1101, and made it a corporation on payment to the exchequer of 100 marks annually. Josfrid, abbot of Croyland, sent four monks to Cottenham near Cambridge, from which place they daily repaired, according to Peter Blefens, to the university town, "and having hired a public barn, made open profission of their sciences, and soon collected a great number of scholars." These continued to increase, and the place progressively acquired celebrity till 1174, when nearly the whole of the town was consumed by a fire "to mercifly," says Fuller, "that it only flapt for want of fuel to feed its fury." Most of the churches, as well as the houses, appear to have been constructed with wood at this period. Tournaments were frequently held at Cambridge in the 15th century, and the concourse of people was so great, that the students were much inconvenienced both in board and lodging. To remove this impediment to learning, Henry the Third forbade any tournament to be kept within five miles of the town. In examining the local annals of Cambridge, we find that frequent disputes and altercation, often ending in battles, arose between the townsmen, and those persons connected with the university. In 1291, a particular instance of this kind occurred. The townsmen assembled at their hall, and having chosen John Grantceter, for their leader, compelled him to swear that he would execute whatever the bailiff and burgesses should command. Proceeding to Corpus Christi college, they broke open the doors, and carried away all the charters, and other documents; they next went to the house of the chancellor, whom they compelled, as well as all other persons of the university, to renounce the privileges that had ever been granted to them, and also deliver up all the letters-patent then in their possession. After this
they broke open the university chest, which was kept in St. Mary's church, and taking out all the records, burnt them in the market-place, together with the papers they had previously collected. Numerous other acts of violence were committed. At length Henry Spencer, bishop of Norwich, coming here with some soldiers, suppressed these daring tumults, and punished the principal leaders: the mayor was deprived of his office, and the liberties of the town were declared forfeited, and bestowed on the vice-chancellor, in whom they remained till the reign of Henry the Eighth, when the corporation was restored, but several of its former privileges were retained by the university.

An insurrection breaking out in the eastern counties in the time of Richard the Second, he summoned a parliament here in 1381. In this assembly a statute was made againstandersers, or students of either university, who traversed the country legging alms without licence, which at that time was a common practice. On the 24th of May 1534, the university renounced the supremacy of the Pope, and the next year surrendered all its charters, flutes, and papistical muniments into the hands of Lord Cromwell. These records were, however, soon afterwards restored, and the university reinstated in the full exercise of its privileges. From the death of Henry the Eighth, till the accession of Elizabeth, the university and town were in continued commotion, and various acts of hostility were committed by the opposite parties. The latter monarch, however, restored peace to the university, where he resided five days in the early part of her reign. Here she was entertained with various dramatic exhibitions, besides orations, disputations, and other academical exercises. On leaving the town, the queen in an elegant Latin speech recommended the members of the university to make the return of its students public.

In 1630, Cambridge was visited by a dreadful plague, which occasioned the burthen of the university to be suspended, and all the students had leave to retire to their respective homes. Between three and four hundred persons fell victims to this direful malady. The affises were at this time removed to Rouillon. During the unhappy warfare between Charles I. and his parliament, the persons of the university very early declared themselves in favour of the king, and as a pledge of loyalty, sent their plate to be converted into money for his use, a few days before the elevation of his standard at Nottingham. This measure provoked the Cromwellian parliament, whose forces laid the town under repeated contribution, and the officers and students of the university were compelled to seek safety in flight. Soon after the restoration, tranquillity was again restored; and since that period, various useful and important plans to promote the prosperity of the town, and the advantages of learning, have been progressively established. The college and fortifications have gradually crumbled in the course of time, and the university has continued to increase its literary reputation from that epoch.

The extent of Cambridge occupies a space of ground which measures about one mile from north to south, and half a mile from east to west. The streets are in general narrow and winding, and the houses ill-built, and too much crowded together. The town was first paved in the reign of Henry VIII. who, in his 36th year, caused it to be enacted by Parliament, that all persons who had any houses, lands, &c. in Cambridge, bordering on the highways, should pave them to the middle of the said ways, "in length as their grounds do extend," and also keep them in repair, under the penalty of fivepence for every square yard. In 1787, an act was passed "for the better paving, cleaning, and lighting the town, and widening the streets, lanes, and other passages." Many improvements in each of these respects have since been effected. The population compared with the limited extent of the town is very great; for besides the persons residing in the colleges, the number of inhabitants returned under the late act was 9,773; of houses 17,332. The trade carried on at Cambridge is not inconsiderable; besides that which is either immediately or remotely connected with the university. The corporation consists of a mayor, high steward, recorder, twelve aldermen, twenty-four common councilmen, four bailiffs, a town clerk, and other officers. The mayor, on the day of his election, has the privilege of belowing the freedom on any one person he may think proper. The choice of representatives in Parliament is vested in the mayor, bailiffs and freemen not receiving alms; the voters are about 200.

The College of Cambridge, of which there are scarcely any remains, was raised soon after the conquest; for 27 houses are said in the Conqueror's survey to have been levelled for the purpose of erecting it. On the site of this ancient fortress, a new, large county gaol was lately built, upon a novel plan. Near this is a large conical mount, the keep of the ancient Norman castle. This occupies the highest ground in the town, and its summit commands a very extensive tract of flat country. In the market-place is a conduit, which was erected, and the water brought to the town by Thomas Hobson the celebrated carrier, in 1614. Near it are the 'fire hall,' and the town hall, two large buildings.

Public Buildings. Cambridge contains 14 parishes, 13 of which are provided with their respective churches. Two only of these are, however, entitled to public notice, the others being mostly small, inconspicuous, and very insignificant buildings. Among the most ancient structures in the town, and certainly the most curious specimen of architectural antiquity it possesses, is the Round Church, or church of the Holy Sepulchre. This is one of the very few imitations which now remain in England, of the church of the Holy Sepulchre at Jerusalem. The original building was perfectly circular, having its roof supported by eight large columns, between which and the outward wall, is a circular aisle. The entrance door-way has a semi-circular arch of three different mouldings, which spring from capitals and columns of that style of architecture usually called Saxon. Indeed the whole structure was originally of this style, but has been altered at later periods; and at the time of such alterations, the architects appear to have adopted the then prevailing mode of building. Mr. Effles (in vol. vi. of the Archæologia) affirms that it was built by the knights templars, or by some persons concerned in the croisades, in the reign of Henry the First, or between the time of the first and second crusade. It is certainly the oldest church of the kind in England, though the temple church in London, and the round church in Northampton, are constructed nearly in their respective ground plans; though their arches, columns, and ornaments, are very different.

The university church, called Great St. Mary's, though a large spacious building, is not remarkable either for its beauty, or uniformity of architecture. It was built by contribution, and though begun in the year 1478, it was not completely finished till 1628. In the years 1783 and 1784 about 1,500l. were expended in "repairing and beautifying this church;" but the alterations not being directed by taste, have neither beauty nor dignity to recommend them to our approbation. The other churches of Cambridge are mostly built with brick walls, which are plastered and whitewashed.
The most conspicuous and most celebrated building of the university is King's College chapel, which, for elegance and beauty of parts, for grandeur of effect, and scientific construction, is justly admired by all artists, connoisseurs, and architects. The design of this structure is at once bold, chaste, and profound: and its exterior and interior effects are grand and imposing. It consists of only one space or cell, which measures 28 feet in length, by 44 feet in width and 93 feet in height. This spacious apartment is surmounted with various attractive beauties: and the sculptor, painter, glazier, and architect, seem to emulate each other in exciting admiration. The whole interior superfluities is covered with numerous sculptured ornaments, among which the arms and cognizances of the houses of York and Lancaster are most prevalent. The rafter, portcullis, fleur de lis, with shields of arms are buck all over the walls. These are carved in high relief, and are executed with great skill and taste. Some of the supports display the hand of a first-rate flautist, and though cut in stone, are equal in contour, expression, and character, to almost any marble sculpture. A wooden screen separates the ante-chapel from the choir. The latter has two rows of stalls of carved wood on each side, and on the pannels at the back part of the upper rows, are carved the arms of all the English kings from Henry the Fifth to James the First. The whole chapel is lighted by 26 large windows, besides some smaller ones, which communicate to different lateral chapels, or chantries. These occupy the spaces between the buttresses, and are now appropriated to libraries, and to other purposes. All the upper windows, except that at the west end, are filled with painted glass, which, for the style of drawing, colouring, composition, expression, &c. manifest great talents in the artists who executed it. The groining and construction of the roof of this fabric are regarded with admiration and astonishment. In forming the arch, and disposing the materials, the architect has displayed such a profound knowledge of geometrical principles, as to confound almost every other artist who has since examined his workmanship. It is traditionally reported that Sir Christopher Wren annually visited this pile, to view the roof; and the same tradition has given currency to an absurd remark, which that great architect is said to have made. This roof was executed by John Wafall, and Herry Semerick, who by an indeniture still extant agree "to make, and let up at, their own costs and charges, a good, sure, and sufficient vault, for the grete church there, to be workmanly wrought, made and let up after the best handling and form of good workmanship according to a plan thereof made and signed with the hands of the lords executors to the kyng of most famous memory Henry the VII, &c." They also agree to provide stone, and every other requisite for the said work, to finish it in three years, and to receive 1200l. for their whole labour and materials.

This magnificent fabric was begun by king Henry VI. who left particular directions in his will, and bequeathed ample endowments for the completion of the chapel and the whole college buildings, &c. But the former was not completed till the reign of Henry VIII., and the latter have never been finished. It appears that only a part of the walls at the east end of the chapel and to a certain height on the north and south sides, were raised during the lifetime of the founder. The building was a little advanced by Richard III.; and Henry VII. made much greater progress in the work. It advanced with rapidity during the reign of Henry VIII., and the choir or shell of the building was finished in 1515. For further particulars relating to the history and character of the structure, see Mallet's Account of King's College Chapel, 8vo.

Near the north side of this chapel is the Senate House, which was built by Gibbs the architect from a design by Sir James Borlase, who was master of Cain College. It was begun in the year 1724, and cost nearly 30,000l. in completing: about 1,200l. of which were contributed by individuals. It is built entirely of Portland stone, and adorned with pilasters, friezes, balustrades, &c. in the Corinthian style of architecture. In the middle, both of the south and east fronts, is a grand triangular pediment, supported by four fluted columns of the same order. The interior is occupied by one large room, where all the public business of the university is transacted. It measures 35 feet long by 42 feet broad, and 32 feet high. Near this building is the Public Library, which consists of four rooms on the upper floor; the ground floor, consisting of three sides of a square, being occupied by the Schools. The library contains many curious, valuable, and interesting objects; among which is an antique statue of Cereus brought from the temple at Ephesus, the Cippus from the tomb of Eulcid, the Ithaca MS.; and numerous other rarities.

Most of the other public buildings being connected with the colleges and halls, we shall notice the most interest under their respective establishments, and shall arrange these in the chronological order of their foundations. Previous to the erection of colleges, the students resided in hostels, or inns, which were provided by the townsmen for their reception. All the charges of education and maintenance were paid by themselves; though the eulogistic degrees and government were, according to the report given of the ancient foundations, nearly the same as at present. In the time of Richard II. the number of hostels at Cambridge amounted to 16. The extraneous terms of landlords' charges probably gave rise to the colleges; as it is recorded that they were very extortionate in their demands.

Colleges, &c.—The university buildings consist of twelve colleges and four halls, which last possess the same privileges as the former. Each of these contains apartments for the students and fellows, a master's lodge, a chapel, a library, a hall, and a combination room. In the following table is recorded, in chronological order, the name and the time of founding of each of these institutions.

<table>
<thead>
<tr>
<th>College Name</th>
<th>Founded Year</th>
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<tr>
<td>1. Peter House College</td>
<td>1537</td>
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<tr>
<td>2. Clare Hall</td>
<td>1539</td>
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<tr>
<td>3. Pembroke Hall</td>
<td>1539</td>
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<tr>
<td>4. Gonville and Caius College</td>
<td>1539</td>
</tr>
<tr>
<td>5. Corpus Christi, or Benc't College</td>
<td>1539</td>
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<tr>
<td>6. Trinity Hall</td>
<td>1539</td>
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<tr>
<td>7. King's College</td>
<td>1541</td>
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<tr>
<td>8. Queen's College</td>
<td>1540</td>
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<tr>
<td>9. Catharine Hall</td>
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<td>10. Jesus College</td>
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<td>11. Christ's College</td>
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<td>12. St. John's College</td>
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<tr>
<td>13. Magdalen College</td>
<td>1570</td>
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<tr>
<td>14. Trinity College</td>
<td>1570</td>
</tr>
<tr>
<td>15. Emanuel College</td>
<td>1571</td>
</tr>
<tr>
<td>16. Sidney Sussex College</td>
<td>1598</td>
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In addition to these, a new college, upon a large and grand scale, is proposed and intended to be erected in pursuance of the will of Sir George Downing. This gentle
man, in the year 1717, devised various estates, &c. in failure of certain issue, for this purpose. The validity of the will was disputed by some of his relatives, but after many years' litigation it was finally settled in 1800, and the matter, professors, and three of the fellows are already appointed: thirteen other fellows are to be chosen when the college is built. We shall proceed to notice a few particulars relating to each of the above-named foundations.

St. Peter's College, usually called Peter-House, originally consisted of two lodges, which were purchased by Hugh de Baldham, sub-prior of Ely, who appropriated them, in 1257, to the use of students. In 1284, he completely endowed his foundation for the support of a master, 14 fellows, 29 bursars, and 8 poor scholars; the number to be increased or diminished according to the fluctuation of the revenues. Numerous benefactions have since been given to this foundation, and the fellowships are accordingly increased. The college was erected by subscription in the year 1632, and is neatly embellished, but was deprived of many of its ornaments by the fanatics in the civil wars. The building surrounds two courts, which are separated by a cloister and gallery, and the largest has had its buildings fixed with stone within a few years.

Clare Hall was built on the site of the University Hall, which was a small college, founded in the year 1326 by Dr. Richard Baden, then chancellor of the university. About 16 years after its erection, it was consumed by fire, but rebuilt on a much more extensive scale in 1344, by Elizabeth de Burg, heiress to the last earl of Clare. By this lady it obtained its present name, with endowment for a master, 10 fellows, and the same number of scholars. Richard III., Thomas Cecil, earl of Exeter, John Freeman, esq., William Butler, esq., and Samuel Blyth, esq., all contributed in augmenting the revenues, which now maintain 17 fellows, and between 30 and 40 scholars. This is the most uniform in its buildings, and is the most pleasantly situated of any college in the university. It was rebuilt of stone in 1638, except its chapel, which was erected in 1705, from a design by sir James Burroughs. This college stands near the north-west angle of King's College chapel.

Pembroke Hall was founded by Mary, countess of Pembroke, in 1332, and endowed in pursuance of a charter from Edward III. for a master and fix fellows. Among the benefactors who have enlarged this establishment, Henry VI. is the most considerable; who augmented it with the rich living of Soham in this county, and with some other rectories. In his charter it is termed "the most noble, renowned, precious college, which, among all others in the university, was ever wonderfully replenished." The present number of fellowships is 16, and the scholars about 70. The chapel was built from a design of sir Christopher Wren, by his uncle, bishop Wren. Contained in a small detached building of this college is a large and curious astronomical machine, or sphere, which was given and partly made by Dr. Roger Long, author of a celebrated treatise on astronomy; in which work it is particularly described; and the Dr. at his death bequeathed the interest of 200/. for bank annuities to keep "the instrument and place" in good repair. This, like many other useful bequests, is perverted to private emolument, and the object consequently neglected. This college consists of two courts, which are separated by the hall, having the combination room at one end.

Corpus Christi, or Bene't College, differs in its origin from all others, in either of the universities; those having been founded by the benevolence of one or two persons, while this was established by the union of two guilds, or religious

C A M B R I D G E.

societies. The college was begun in 1534, and its buildings were rapidly advanced by the influence of Henry Plantagenet, duke of Lancaster, whom the brethren had chosen as their first warden. By the munificence of sir John Cambridge and his son, the revenues were considerably augmented and finally appropriated, in the year 1576, to the maintenance of a master, eight fellows, three bursars, and five scholars. Since that period, the endowments have increased sufficiently to support twelve fellowships, and nearly sixty scholarships. The name of Bene't, or Benedict college, arose from its proximity to the church dedicated to that saint. Matthew Parker, archbishop of Canterbury, was the greatest benefactor to this college, having founded two fellowships and five scholarships, and bestowed on it the valuable library of Stoke-clere college, Suffolk, besides many other printed books and manuscripts. This college consists principally of buildings round a square court.

Gonville and Caius College, commonly called Keys College, was originally founded in the year 1348, by Edmund Gonville, who left a large sum of money with Dr. Bateman to finish and endow it. The doctor being then employed on his own college (Trinity) did not immediately proceed with this building, but afterwards had it erected near his own foundation. Thus the present building is posterior to that of Trinity, but its foundation and endowment being anterior, it certainly claims precedence in chronological arrangement. After its completion, it was called Gonville Hall; but in 1557 it obtained the present title, and was considerably increased in revenues and buildings. This was effected by Dr. John Caius, physician to queen Mary, who built a new court, and three remarkable gates of various and eccentric architecture. That on the south, communicating with the schools, is said to be the first specimen of regular or Roman architecture erected in this country. The gates are respectively inscribed, "Humilitatis," the gate of Humility; "Virtutis," the gate of Virtue; "Io. Caius Pohnt Sapienian," John Caius built this in honour of Wisdom; "Honoris," the gate of Honor. Since the decease of Dr. Caius, the fellowships have increased to 29, and the scholarships to nearly 100. The principal court of this college has been partly rebuilt, and is cased with stone.

Trinity Hall was one of those original colleges wherein the students resided at their own expense. It was purchased by Richard Crowder, prior of Ely, in the reign of Edward IV.; and was converted into a college, in 1351, by Henry Bateman, bishop of Norwich. The founder provided for a master, three fellows, and two scholars; but various subsequent benefactions have increased the fellowships to twelve, and the scholarships to fourteen. The whole of this hall is faced with stone, and the buildings have a neat and uniform appearance.

King's College, the glory and pride of the university, owes its origin and foundation to King Henry VI. who, in 1441, dedicated it, and in 1442 fully endowed it for a provost, 70 fellows, or scholars, 3 chaplains, 6 clerks, 16 choristers, and a master, 16 officers of the foundation, 12 fellows for the senior fellows, and 6 poor scholars. The monach, dying before the establishment was completed, left particular directions and bequests in his will for the fulfilment of his magnificent and pious designs. These, however, were never completed, and only a small part of the intended buildings have been erected. Some peculiar privileges appertain to this college. (See Rawthorpe's University Calendar, 1801.) Edward IV. instead of forwarding the plans of his predecessor, deprived this college of many large estates, which, with aggravating injustice, he gave to some of the
Trinity College contains the largest buildings, and possesses the most considerable endowments of any collegiate establishment in this university. Its buildings form two very large quadrangular courts, and its entrance, gateway, chapel, and library are fine and interesting objects of architecture. This college was founded by Henry VIII. in 1536, on the site of two other colleges and a hospital, and endowed for a master, fifty fellows, sixty-seven scholars, four conductors, three public professors, thirteen poor scholars, twenty benefactors, and other officers with servants: the number on the establishment, at present, amounts to upwards of four hundred. The inner court is called Neville's court, from the name of Dr. Thomas Neville, at whose expense it was chiefly built, in the year 1559. Its western side is formed by the library, which is a magnificent and spacious building, 200 feet in length, by 40 in breadth, and 58 in height. Beneath the library is a spacious pizza, which opens to the river and the gardens. In the chapel is a fine statue of Sir Isaac Newton, executed by Roubiliac. This figure is considered one of the finest specimens of English statuary.

Emanuel College was founded by Sir Walter Mildmay, on the site of a Dominican convent, in 1584, and endowed for a master, three fellows, and four scholars. By additional donations the revenues now support fifteen fellows, and nearly one hundred scholars and exhibitioners. The hall is said to be the most elegant of any in the University.

Sidney Sussex College derives its foundation from Frances Sidney, countess of Sussex, who, by will, dated December 6th, 1538, bequeathed 5000l. and some other property to found a college for a master, ten fellows, and twenty scholars. The first stone of this college was laid on the 26th of May 1556, and the building completed in little more than three years. The chapel and the library were rebuilt about twenty years since, and various other alterations made at the same time. The foundation provides for seven fellows, ten by-fellows, twenty scholars, and twenty-four by-scholars, besides a mathematical lecturer, and several exhibitioners.

In each, and all of these colleges, are various portraits of founders, and eminent persons who have received education, or been immediately connected with the respective foundations. Each, also, contains a library, and in some are various useful, curious, and valuable natural and artificial objects. Numerous manuscripts, mss., &c. contribute to enrich, and dignify many of these libraries; but to particularize the whole, or even barely to mention the most considerable, or important, would compel us to extend this article beyond the bounds of propriety and consistency. At the end we shall refer to such works as contain more detailed information on these subjects.

The colleges of this University are accommodated with spacious and pleasant gardens, having convenient walks, which are shaded and enriched with rows of noble trees. Most of them are situated on the banks of the river Cam, at the western extremity of the town. It is jutly remarked by strangers who visit Cambridge, that its colleges and public buildings are, in general, neither grand, elegant, nor in a good style of architecture; and that a national University should display and encourage the polite arts of the country. In the college now preparing to be built, it is hoped that the directors or Committee will select such designs as shall at once be a monument of their taste, an honour to the University, and creditable to English talent.

The University is composed of a chancellor, vice-chancellor, the masters or heads, fellows of colleges, and students, amounting in all to more than 2000 members; and is incorporated...
incorporated as a society for the study of all the liberal arts and sciences. Each college, or hall, is a body of itself, and bound by its own statutes; but is likewise controlled by the paramount law of the University, each furnishing members for the government of the whole, which government is administered by the following officers:

1. A Chancellor, who is some nobleman, and may be changed every two years, or continued longer by the tacit consent of the University.— 2. A High Steward, chosen by the senate, and holding his office by patent from the University; he is allowed a deputy.— 3. A Vice-chancellor, who is usually the head of some college or hall, and chosen yearly on the 4th of November, out of two persons nominated by the heads.— 4. Two Proctors, chosen annually on the 10th of October, who must be masters of arts; they attend to the discipline and behaviour of all under-masters of arts; read the grades, and take the votes in the White-hood house.— 5. Two Tutors, chosen as the proctors, and who with them are clerks of the markets, and have cognizance of weights and measures; they were originally intended to tax, or fix the rent of the houses let to the scholars for their residence.— 6. Two Moderators, who superintend the exercises and disputations in philosophy, and the examinations previous to the degree of bachelor of arts.— 7. Two Scrutators, whose office is to read the grades, and take votes of the Black-hood house, to which they always belong.— 8. A Commissary, who is usually appointed an ailiant or alliell, and deputy high-dean to the vice-chancellor in his court, (much the same as a recorder is to a mayor, or a chancellor to a bishop).— 9. A Public Orator, who is the mouth of the University on public occasions, writes their letters, presents noblemen to their degrees with a speech, &c.— 10. The Caput confits of the vice-chancellor, a doctor of divinity, a doctor of laws, a doctor of phyfic, a regent and non-regent master of arts, who are chosen yearly on the 12th of October, and are to consider and determine what grades are proper to be brought before the body of the University; and each of them has a negative voice. All grades must first pass the caput before they can be produced to the senate.— 11. Two Librarians.— 12. A Registrary.— 13. Three Esquire Bedells, &c. There are also professors in divinity, civil law, phyfic, canalify, hebrew, grec, arabic, mathematics, philophy, astronomy, anatomy, chemistry, botany, modern history, common law, fossils, and musie.

The Senate is composed of all the doctors and masters of arts in the University, and is divided into two bodies; or houses. The first consists of regents, or those who have not been masters of arts five years; they are also called white-hoods, from the hoods of their official dresses being lined with white flilk. The second, of non-regents, or those who have taken the degree of master upwards of five years, but have not advanced to the degree of doctor; these are called black-hoods for a similar reason. The doctors under two years standing vote solely in the regent-house; but all others, with the public orator, may vote in which house they please; and either house is competent to reject a question. In the senate-house the election of all officers takes place, the appointments of the magistrates, the admission to degrees, and all other important business of the University. No language but Latin is permitted to be spoken at any official meeting in the senate-house. Some questions are determined by the body collective, as the choice of members of parliament. At the election in 1799, the number of members who voted was 684; absent, or did not vote, 181; in all 865. The privilege of sending members to parliament was first granted to the University by James I. in 1604. The whole number of fellowes in the University is 456, and of scholars 695; besides which there are 276 inferior officers and servants of various kinds, who are maintained on the foundation; these, however, are not all the students of the University. There are besides two other orders, called penitent, the laity, and the laity of both orders, the persons who have the benefit of nobility and gentlemen of fortune, who are called fellow-commoners, because, though not of the foundation, they are permitted to take the said degrees in an inferior fortune, called fizaras: these, though not of the foundation, are capable of receiving many benefactions called exhibitions, which assist them greatly in passing through an expensive education; and frequently, by merit, they succeed to the highest honours and emoluments. The students, according to their standing and proficiency in learning, are entitled to the degrees of bachelor and master of arts, bachelor and doctor in divinity, phyfic, and law. The time required by the statutes for studying in the University, before each can be qualified for taking the said degrees is three years for a bachelor, and about four years more for a master of arts; seven years after that he may commence bachelor of divinity, and then five years more are required to take the degree of doctor in divinity. In law, a student may commence bachelor after six years, and in phyfic after five years standing; both may be professors at the end of five years more. The proper time for conferring these degrees is called the commencement, which is always the first Tuesday in July, when the masters of arts, and doctors of all faculties, complete their degrees respectively. The examination for the degree of bachelor of arts usually begins on the Monday forenoon after the Epiphany, and the degree is completed on the second tripos-day next following. Persons are commonly admitted to the degree of bachelors in divinity on the 15th of June. The nobility, which includes baronets, as such, are entitled to degrees without waiting the flattable time. In the year 1786, some disputst having arose concerning the practice of conferring degrees in right of nobility, the statutes were examined, and it was determined that the following persons were entitled to honorary degrees: viz. 1. Privy-councillors.— 2. Bishops.— 3. Noblemen.— 4. The eldest sons of such persons.— 5. Persons related to the king by consanguinity or affinity, provided they be also honourable.— 6. Sons of Noblemen.— 7. The two last to the degree of M. A. only.

As a stimulus to that laudable emulation which should ever be encouraged in the youthful mind, the University, and different individuals have left several sums of money, &c. to be annually distributed among the scholars, as "the reward of merit."—The yearly donations thus bestowed by the University amount to £251l. 5s. of which £51. is given to such as excel in mathematics, and £20l. 5s. for the encouragement of classical and English compositions. The annual prizes conferred by individual colleges amount to £280l. two-thirds of which are appropriated to promote classical literature.

Thus, by the liberality of different persons, zealous for the honour and advantages of learning, has this University attained a high degree of eminence, and many of its members have been materially benefitted. The various incentives to excellence here held forth, and the numerous rewards of merit annually distributed are exquisitely adapted torouse genius into energy, and impel sluggishness to action, to give resolution to timidity, and furnish modesty with hope. How animating must it be to the emulation of minds, to reflect
reflected, that, "it is placed under those venerable walls, where a Hunker and a Bacon, a God and a Newton, once pursued the fame course of Science, and from whence they soared to the most elevated height of literary fame. This is the incitement which Tully, according to his own testimonies, experienced at Athens, when he contemplated the portico where Socrates sat, and the laurel grove where Plato disputed." (Idler, No. 33) *N. lat. 52° 12' 36". E. long. 0° 4' 15'.

"Majestic Grant, hail thy awful name,
Dear to the muse, to liberty, to fame!

Mason.


CAMBRIDGE, a township in Granton county, New Hampshire, North America, of Androscoggin, and S. of Umbagog lake.

Also, a township of Washington county, New York, containing, by the census of 1790, 4996 inhabitants, including 41 slaves; and by the census of 1796, it appears, that it has 623 electors.—Also, the half-town of Middlesex county, Massachusetts, which is one of the largest and most respectable townships of the county. Its three parishes, Cambridge, Little Cambridge, and Menotomy, contain three congregational meeting-houses, one for Baptists, and another for Episcopalians, a number of pleasant farms, and 2115 inhabitants. It is connected with Boston by an elegant bridge. The public buildings are the meeting-houses, court-house, and the edifices belonging to Harvard University, which are four in number, viz. Harvard, Hollis, Maffachette Hall, and Holden chapel. The University is, with regard to its library, philosophical apparatus, cabinet of minerals, and professorships, the first literary institution on the American continent. It takes its date from the year 1638, seven years after the first settlement in the township, then called Newtown. It has generally from 140 to 200 students. By a mean of the observations made in this place during the years 1781 and 1783, its temperature appears to be 50° 3', that is, about 10 degrees below the European standard. N. lat. 42° 25'. W. long. 71° 10'.—Also, a post-town of Ninety-six district, in the upper country of South Carolina, where the circuit courts are held. It contains about 65 houses, a court-house, and a brick-gate. The college by law instituted here, is no better than a grammar-school: 80 miles N. W. of Columbus; 50 N. by W. of Augusta in Georgia; 140 N. W. of Charlestown, and 762 S. W. of Philadelphia. N. lat. 34° 39'.—Also, the chief town of Dorchester county, Maryland, situate on the south side of Choptank river, about 15 miles E.S.E. from Cook's point at its mouth; nine W.S.W. from Newmarket; and 57 S. E. from Baltimore. Its situation is healthy, and it contains about 50 houses, and a church. N. lat. 38° 34'.—Also, a town of Franklin county, Vermont, situate on both sides of La Moille river, about 20 miles W. of Lake Champlain. It has 350 inhabitants.

Cambridge Manuscript, or Beza's MS. A copy of the Gospels, and Acts of the Apostles in Greek and Latin, noted by Wetstein in the old and 3rd parts of his Grammatica Testamenti, by the letter D. In the Greek it is defective, from the beginning to Matth. i. 20; in the Latin, to Matth. i. 12; and it has likewise the following chaunis: Matth. vi. 20.—ix. 2. xxvii. 1—12. John, i. 16.—iii. 26. Acts, viii. 29.—x. 14. xxii. 10.—xxi. 20. And from xxii. 29 to the end. Some pages of this MS. containing Matth. iii. 8—16. John, xviii. 13.—xx. 13. Mark, xvi. 15, to the end, are written by a later hand, which Wetstein refers to the 10th century, but Grimm to the 13th. The Gospels are arranged in the usual order of the Latin MSS. Matthew, John, Luke, Mark; Dr. Kipling, in a preface to his edition of this MS, has copied his old citations upon it under four distinct heads, of which we shall avail ourselves in the sequel of this article. He begins, "with establishing its high antiquity. It is matter of course, by the most competent judges, that this MS. is one of the most ancient. Those who give it the least antiquity, affirm to the 6th or 7th century. Wetstein and J. D. Michaelis deem it much older; and Dr. Kipling is of opinion, that it is more ancient than the Alexandrian MS. and must have been written in the second century. His conjecture is founded on these circumstances; that it wants the doxology at the end of the Lord's prayer, and has the Ammonian sections, without the Eusébian canons. That the doxology is an interpolation, admits of little doubt; but it is not so clear how the want of it in a MS. furnishes a proof of the high antiquity of that MS. If the writer of Beza's MS. were a Latinit, he might leave out the doxology in his Greek copy, because it was not in his Latin copy; or his Greek copy might have been one of those which wanted the doxology. Dr. Kipling's argument, derived from the entire omission of the Eusébian canons, and from the Ammonian sections being added by a posteriori writer, is more forcible. Hence he infers, that the text of the MS. was written antecedently to the date of the Ammonian sections, and thence before the Eusébian canons appeared. Ammonius lived in the third, Eusébin in the fourth century; the Ammonian sections in Beza's MS. are much posterior to the text, and are without the canons of Eusébius; therefore it is highly probable that those sections were added to the MS. before the fourth, and that the MS. itself was written before the third century. However, a MS. of the 5th, 6th, or 7th century might have been written, in uncial letters, without either the marginal sections of Ammonius, or the canons of Eusébius; and the former might have been added without the latter some years after that period. This argument has been applied by Grib, Caufey, and Woide to the Codex Alexandrinus (see Alexandrian copy), and by Hieltzel to the Codex Vaticanus. It deserves to be further illustrated and examined. In MSS. of the New Testament, the four Gospels are divided into greater and smaller portions; the one called τετάρτον, the other κωδων; in the same manner, though in different proportions, as we divide them into chapters and verses. The τετάρτον, or larger portions, were generally marked in the upper margin; the κωδων, or, as they frequently called, the Ammonian sections, were always marked at the side; and those sections Eusébin adapted his ten tables, or harmony of the Gospels, to which he referred by writing, under each of the Greek letters or numbers expressible of the Ammonian sections, letters which denoted that part of each table where the section was to be sought. This is clearly exhibited either in Stephens's edition of 1559, or in Kützer's edition of Mills's Greek Testament. The Acts of the Apostles, and the Epistles, were likewise divided into sections, called, from the inventor, the sections of Eusébius; and they were noted in the margin by letters, in the same manner as the Ammonian sections in the Gospels. As the Greek sections are not marked in the margin of the Acts of the Apostles, and the Epistles, in the Alexandrian copy, though the τετάρτον and κωδων are noted in the Gospels, Grib, Caufey, and Woide, contend, that the Alexandrian copy was written before Eusébius had introduced these sections, that is, before the year 376. Mr. Marsh, however, (ubi infra) observes, that a considerable time might have elapsed after the year 376, before these sections were brought into
into general use. Besides, though no sections are marked in the margin of the Alexandrian copy, in the Acts, and the Epistles, yet the text itself is very distinctly divided into sections, by blank spaces at the end of each section, and by large letters written in the margin, at the beginning of each section. The divisions into smaller portions was probably later than the division into larger portions; and the portions into which the Acts of the Apostles are divided in the Alexandrian copy, appear to be nothing more than a subdivision of the Euthalian sections. Upon the whole, says Mr. Marth, the writer of the Codex Alex. seems to have been unacquainted with the Euthalian division, and Woide's argument is indecisive. In applying the same argument to Beza's MS. the same objection will occur. For though no sections are noted in the margin, yet the text itself is divided into sections, not by blank spaces, as in the Alexandrian copy, but by the first word of each section being so written, that the first letter stands in the margin, which is sometimes greater, but in general of the same size with the other letters. It appears, on an examination of Beza's MS., that whenever an Euthalian section commences in the Alexandrian MS., a new section begins in Beza's MS., and that the sections of these two MSS. in the Acts of the Apostles, are only different subdivisions of the Euthalian sections. This argument, therefore, instead of being favourable to these MSS., rather proves, that neither of them was written before the fifth century.

Moreover, the marks of Eusebius are wholly unnoticed in the margin of Beza's MS.; and the marks of Ammonian, or Euthalian sections, are not accompanied with the references to the canons of Eusebius. This is observed by Mill, in his "Prolegomena," who ascribes the omission of these references to forgetfulness; but this, says Mr. Marth, cannot have been the reason, because the fections are sometimes written so close together, as to leave no room for a reference between them. This ingenious writer expresses his surprize that Mill did not deduce this very obvious inference from the omission of these references to the canons of Eusebius, viz. that Beza's MS. was written, not indeed before the time of Eusebius, but before the tables which he invented were brought into general use; and as Eusebius was a man of so distinguished a character, and we know that Jerom from himself adopted these canons, we might suppose, that they were generally adopted within 100 years after their invention. But the true reason why Mill did not apply this argument, was his having seen several other MSS. of the gospels besides Beza's copy, which have the Ammonian sections without the references to the canons of Eusebius. Their absence, therefore, from the Codex Beza affords no absolute proof of its antiquity. Besides, the Ammonian sections in Beza's MS. are noted in the margin by a different, and, of course, later hand, than that which wrote the MS. itself. This is affected by Mill, Wetstein, and Griesbach, who have all examined the MS. Although the Ammonian sections are noted in the margin with the same uncials as are used in the text, and the ink is in both places of the same tawny colour; yet the letters in the margin are somewhat smaller than those in the text, and some of the former, when closely examined, manifestly differ from those in the latter. Influences to this purpose are produced by Mr. Marth. It is certain also, he adds, that the writer of the Codex Beza did not intend that the text should be divided into the Ammonian sections; for he has actually divided it into sections of a totally different kind. They are denoted by the first word of each section projecting into the margin; so that the first letter stands out of the text, but is contiguous to the second letter, and is generally of the same size with the rest, although it is sometimes larger. A further proof that the writer of the Codex Beza did not intend to mark the Ammonian sections, is, that an Ammonian section frequently begins in the middle of the line; whereas those above mentioned commence always at the beginning of the line. And though the persons who added the Ammonian sections has constantly added two dots (:) before the word which begins the section, yet the interval is frequently so small between it and the preceding word, that he was obliged to add them nearly at the top of the letter. What argument then can be deduced from the above-mentioned omission, in respect to the antiquity of Beza's MS.? If we conclude that it was written before the invention of the Ammonian sections, we shall refer it to the beginning of the third, or the end of the second century; against which it may be objected, that the conclusion would be too hasty, because a considerable time might have elapsed before their use became general. But as these divisions were adopted and recommended by Eusebius in the fourth century, and likewise by Jerom at the end of the fame, and beginning of the following century, they must have been universally known before the close of the fifth; and though it may be said that the writer of the Codex Beza must have copied from some more ancient MSS., and might therefore transfer the old, long after the new divisions were introduced, we may reply, says Mr. Marth, that as the Codex Beza is written in a splendid and expensive manner, it is probable, that the persons or persons for whom it was written, would have chosen that such chapters or sections should be observed in it, as were in general use at the time when it was written. If we argue, therefore, from the omission of the Ammonian sections, we may fairly conclude, that the Codex Beza is at least as ancient as the fifth century. But as the writer of this MS. has adopted sections in the Acts of the Apostles, which imply the previous existence of the Euthalian sections, we would not, says Mr. Marth, ascribe to it a greater antiquity. If we argue, says this judicious critic, from the internal evidence of the text, and conclude from the antiquity of its readings, that is, from the circumstance that the Codex Beza is free from many spurious additions and alterations, that were introduced into the more modern Greek MSS.; the inference deducible is, not that the MS. itself is ancient, but only that it has a very ancient text, which is a matter of much greater importance than the antiquity of the vellum and the ink. It is certain that it was written before the eighth century, from the shape of the letters, the want of intervals between the words, and also of accents and marks of aspiration; for in the eighth century, the Greek ucial letters degenerated from the square and round form, which is seen in the Codex Beza, into an oblong shape; marks of aspiration, and accents were added, and the elegance of writing considerably decreased. It appears also from comparing the letters of the Codex Beza with the Greek inscriptions given by Montfaucon, (Pal. Græc. p. 158—175) not only that it must be more ancient than the eighth century, but that it may be as ancient as the fifth, the fifth, or even the fourth century. No inscription resembles it so exactly, as to the shape of its characters, as that given by Montfaucon, which was engraved about the middle of the fifth century, in the reign of Justinian. But this is no argument against its higher antiquity. Upon the whole, from comparing the Codex Beza with Greek inscriptions of different ages, we may conclude that it cannot have been written later than the fifth century, and that it may have been written even two or three centuries earlier. The tawny colour of the ink differs, indeed, the highest antiquity; but no great effects can be laid on this circumstance, because, if two MSS. were written with the
the same ink, the one in the fourth, the other in the sixth century, they would probably be faded at present in a nearly equal degree; and the difference between 12 and 14 hundred years would hardly be sufficient to enable us to discover at present any difference in the colour; not to add, that as some inks are more durable than others, the letters of a modern MS. may be more faded than those of a more ancient MS. With respect to the comparative antiquity of the Codex Bezae with that of other MSS., it may be safely affirmed, that no one can be put in competition with it, except the Codex Vaticanus. The most ancient Greek MSS., meaning those only which are quoted by Wetstein, besides these two, have, according to him, the natalia and ex-

\[ \text{Codex Bezae} \]

\[ \text{Codex Vaticanus} \]

We may therefore suppose, that those which have more ancient divisions, and have other marks denoting the greatest antiquity, are in this respect entitled to the highest rank. If it is asked to which of these the precedence is due, Mr. Marth replies, to the Codex Bezae; for the Codex Vaticanus has accents and marks of aspiration which were added by the person who wrote the MS. itself.

The second object to which Dr. Kipling directs his attention is the nature and excellence of Beza’s MS. Antony Arnauld maintains, that it is a forgery of the 6th century, and therefore, unworthy of credit; and his chief argument for this unfounded opinion is, that it has additions or interpolations, which are not found in the copies anterior to that period: but this assumption is not just, for it is very far from being certain that the same and similar interpolations were not found in any other MS. before the 6th century. Dr. Kipling, on the other hand, alleges, by a method of reasoning not very satisfactory, that the additions above mentioned are proofs that either the MS. of Beza, or its archetype, must have been written before Jerome corrected the text of the New Testament, because they are not in his version. Bengelius supposes this MS. to be of British manufacture, from its very great conformity with the Anglo-Saxon version; and that it was reformed, or rather deprived, by means of the Italian version. To which it is replied, that the MS. of Beza resembles the Syriac version as much as it does the Italian and Anglo-Saxon; and therefore, it may as justly be called a Syriacizing MS. as a Latinizing one. In this connection we may observe, that according to the opinion of Wetstein, in which he was generally followed, till Semler questioned it, the Codex Bezae contained a Greek text which was altered from the Latin; or, in other words, that the version of the Codex Bezae departed from the readings of the Greek MS. or MSS. from which he copied, and introduced in their stead, from some Latin versions, readings which were warranted by the authority of no Greek MS. Allowing as a fact, that a great number of the readings peculiar to the Codex Bezae are found in the Vulgate, and that they are found in no Greek MS. at present known, and that with regard to most of the readings, in which the Codex Bezae differs from all the Greek MSS., it agrees with some one of the Latin versions published by Blanchini; shall we hence conclude, that these readings were actually borrowed from a Latin version, and translated into Greek? It is at least as possible, says Mr. Marth, that they might have had their origin in the Greek, as in the Latin; and this possibility is sufficient to defeat the whole of Wetstein’s hypothesis. Besides, it is highly probable, as well as possible, that this might be the case. It is merely more reasonable to suppose, that a translation would be altered from an original, than an original from a translation: and this supposition is confirmed by fact, for when Jerome revised the Latin version by order of pope Damasus, he corrected it from Greek MSS. Besides, the Codex Bezae has additions, omissions, and trans-

\[ \text{positions} \]

which are found neither in the Vulgate nor any other Latin version now extant. Since, therefore, the Latin versions of that MS. agree with the Greek text, even in places where it is supported by no Latin MS. at present known, we must conclude, that the Latin was adapted to the Greek, and not the Greek to the Latin. That the Codex Bezae should agree, either with the Vulgate, or some other Latin version, is not extraordinary, when we reflect, that this MS. is one of the oldest now extant, and that the Greek MSS., from which the Latin versions were made, come nearer to it, in point of time, than to those Greek MSS. from which the Codex Bezae differs. To this must be added, that a great number of these readings are found in the Syriac, the Coptic, the Sahidic, the margin of the Philoxenian version, the Verfo Syra-Hierofpatterns, and the quotations of Origen. And we must suppose that all these have been corrupted from the Latin; if the charge be true, with respect to the Codex Bezae. There is no reason whatever for ascribing any reading of a Greek MS. to the influence of the Latin, unless it can be proved, that it could not have taken its rise in the Greek, and that it might easily have originated in the Latin. But no influence of this kind has been produced from the Codex Bezae. Michaelis mentions two instances out of many more which might be produced, which seem to refute the copyist from the charge of having corrupted the Greek from the Latin. The Greek text varies sometimes even from the Latin version, with which it is accompanied. 2. The Latin text appears, in some cafes, to have been altered from the Greek. We shall only add, under this head, that as the Codex Cantabriogenis was probably written in Europe, as appears from its being accompanied with a Latin translation, it seems improbable that the Syriac version should be used in the correction of a MS. written in a country where the Syriac language was wholly unknown; and the only supposition that can make the conjecture probable is, that the Greek text of the Cod. Cant. was taken from a Greek MS. written in Asia. But this conjecture is altogether unnecessary. Upon the whole, the Biblical critic may probably not demur in subscribing to the judgment of Mill or Senler, as to the utility of this and other similar Greek-Latin MSS.; that they are valuable monuments of antiquity, and exhibit many important readings, to be found in no plain Greek copies, but which are mostly inferred in the old Italic version, and in the works of the Latin fathers.

As to the Latin version, annexed to the Greek of Beza’s MS., it is evidently the old Italic, before it was corrected by Jerome. It is, in general, an exact counterpart of the original, from which it rarely deviates. The intention of the writer, whoever he was, seems to have been to make his Latin copy tally with the Greek. That he adapted his Latin version to his Greek text is clear from many passages that might be adduced. On the other hand, the writer of Beza’s MS. sometimes, though not so frequently, adapted his Greek text to some Latin copy. In John, v. the Greek has ἢδεικται instead of ὐδεῖται, which reading, it is probable, was never found in any pure Greek copy of St. John: but it is the Latin reading of Corby’s MS. as well as of Beza’s; to which the former bears throughout a strong resemblance. Dr. Kipling imagines, for reasons which he alleges, that the Latin version in Beza’s MS. is not all written by the same hand.

The third object of Dr. Kipling’s research is the persignations of the Cambridge MS., which he traces from Egypt to Cambridge. We shall, with Michaelis, invert the order of this route, because our knowledge of it in later times is certain; whereas the higher we ascend, the greater is the obscurity in which we are involved, till at length we lose ourselves.
ourselves in the maze of those unwarranted conjectures that have been hazarded by Wetstein. It is a 4to folio, and written on vellum; 66 leaves of it are much torn and mutilated, ten of which are supplied by a later transcripter. In 1581, the University of Cambridge received this MS. as a present from Theodore Beza, who then resided at Geneva. It had been in his possession since 1575 or 1576, and was found, according to his account, in the monastery of St. Irenaeus at Lyons, in the year 1562; from which period he made use of it till the year 1581, and has frequently quoted it in his edition of the Greek Testament, published in 1582. Beza wrote, in the beginning of this MS., the following account with his own hand. "Et hoc exemplum venerandæ vetulae ex Graeci, ut appareat ex barbaris quibusdam Graeci ad marginem notatæ, olim exportatum, et in S. Irenaei monasterio Lugudunensi, ita, ut hic cernitur, mutatam, polliquam ibi in pulvere diu Jacucent, repertum, oriente ibi civili bello, Anno Domini 1562." He gives the same account in his letter to the University of Cambridge, dated Geneva, 1st. Decem. 1581; and in the page preceding the preface to his edition of the Greek Testament, printed in 1582.

That the MS. came originally from Greece is conjecture; but that it was discovered in the monastery of St. Irenæus, at Lyons, depends upon the direct and positive evidence of a man, whose veracity we have no reason to doubt. Wetstein affirms, and it has been frequently maintained by others, that the Cod. Cantab. and the Codex B. Stephani, which, as he relates, some of his friends had collaborated in Italy, for his edition of the New Testament, in 1550, are one and the same MS. Beza, however, quotes them as totally distinct; but in the opinion of Michaelis very obvious circumstances decide in favour of Wetstein. Mr. Marsh, without deciding on the question, impartially states the arguments on both sides, and leaves the determination to the reader. In favour of the opinion, that they are one and the same MS. Wetstein alleges, 1. That the Lectiones singulares, amounting to 450, quoted in Stephens's Margin from the Codex B., agree exactly with those of the Codex Beza, except in some few inflections, which appear to be typographical errors. 2. That where the Codex Beza has chains, no readings are quoted in Stephens's Margin from the Codex B., though, if we except these chains, the Codex B. is quoted by Stephens in every page. 3. That several remarkable additions to the common text, found only in the text of the Codex Beza, are quoted by Stephens from his Codex B. Against these arguments the following objections may be urged: 1. That the Lectiones singulares, quoted from the Codex B., do not amount to 450, but only to 211. 2. To the second argument it may be replied, that the premises are not perfectly true, for the Codex B. is actually quoted by Stephens in four inflections, where the Codex Beza has a chain. In favour of the opinion, that the Codex Beza and the Codex B. are two distinct MSS. may be alleged 1. The following arguments: 1. It appears from the direct and positive evidence of Beza, given clearly and consistently at three different times, that his MS. of the Gospels and Acts was discovered in the monastery of St. Irenæus, at Lyons, in 1562, and that from the intelligence he could procure, it had lain there time immemorial. If this account be true, the Codex Beza could not possibly have been collated in Italy by Henry Stephens fifteen years prior to that period, and the MS., which Stephens collated must now be buried in some Italian library. 2. Henry Stephens, who collated the Codex B., lived in habits of intimacy with Beza, and printed some of his editions of the Greek Testament; and must unavoidably have been led by the same curiosity, which induced him to examine every Greek MS. which he could procure, to inspect, at least, the two celebrated MSS., which Beza used in his edition of 1572, and in which H. Stephens himself wrote the "Exhortatio ad Lectorem." If, therefore, Beza's MS. of the Gospels and Acts had been the very family which he himself had collated a few years before, he must have recognized it as remarkable a MS. and of course would have mentioned it to Beza. But Beza has no where given a hint of its being the same, though he had a fair opportunity of doing it, where he speaks of the MS. which he himself had collated, viz. in the preface to the edition of the Greek Testament of 1587, printed three years after Beza's third edition; and Beza constantly quotes it as a different MS. from the Codex Stephani. 3. In four inflections, where the Codex Beza is defective, Stephens quotes readings from his Codex B. 4. The author of the "Specimen Animadversionum in Prolegomena Wetstini," has produced twenty readings, in which the Codex Beza and the Codex B. contradict each other. 5. Through the characteristic readings of the Codex B. are found in general in the Codex Beza, yet, on the other hand, there are some very long and remarkable readings in the Cod. Beza, which Stephens has not quoted from his Codex B. To these arguments for the diversity of the MSS. it may objected, 1. That Beza's positive evidence can go no further than to the place where, and the time when, the MS. was found, not to the number of years, during which the MS. had been preserved there. 2. That though H. Stephens, who collated the Codex B., and most frequently have seen the Codex Beza, has now no where attested that they were one and the same MS., yet the argument drawn from his silence is only negative, and that arguments of this kind are always conclusive. But it is more difficult to find an answear to the other part of this argument, viz. that Beza had constantly quoted the two MSS. as distinct; which he hardly would have done, if Henry Stephens had ever observed that they were one and the same. Wetstein, however, who takes for granted, that H. Stephens actually informed Beza that they were one and the same MS. goes so far as to ascribe Beza of a wilful intention to deceive. 3. That the four quotations from the Codex B., in the two places where the Codex Beza has a chain, may be explained, either on the supposition, that two leaves, which are now wanting, have been lost since Stephens's time, or as typographical errors. 4. That the argument drawn from the contradictions referred to is inconclusive, because many inflections may be produced of collations made by different persons from the very same MS. which contradict each other more frequently than the extraæs from the Codex B. contradict the readings of the Codex Beza. 5. That the fifth argument is not absolutely decisive, since it is possible that H. Stephens might overlook the most remarkable readings, even in places where we should least expect it; and likewise possible, if he had noted them, that the same remarkable readings might have been overlooked both by R. Stephens and Beza. Michaelis, who adopts the common hypothesis, that the Codex Beza and the Codex Stephani B. are one and the same MS., is reduced to the necessity of supposing, that the MS. which Henry Stephens collated in Italy, not long before the year 1550, was afterwards deposited in the monastery of St. Irenæus, and there discovered in 1562: though Beza declares expressly, that it had lain there time immemorial. Dr. Semler conjectures, that the Codex Stephani B. might have been a transcript of the Cod. Cant. and brought to Italy a short time before it was collated. Wetstein conjectures, that the Codex Beza was either preferred during some time at Trent, or that Henry Stephens, after having collated
collated it in Italy, delivered it to the bishop of Clermont, at the time when the celebrated council was held there, in 1546, and that the bishop brought it from the council to his diocese of Clermont in Auvergne. These two parts of Wettstein’s hypothesis directly contradict each other; for it appears, from Maturine Hist. Stephanus, that H. Stephens did not go to Italy till after the death of Francis I., which happened in 1547. He could not, therefore, deliver it to the bishop of Clermont, at Tint, in 1546; and if the bishop was in possession of the Codex Bezae, and brought it home with him, which we must suppose, it is, if delivered at Clermont in Auvergne, in 1549, it cannot probably have been the MS. which H. Stephens collated in Italy, between the years 1547 and 1556. Wettstein supposes, that Beza’s MS. was found in France about the year of Christ 1546, and that it is the same copy which Drustmar, an ancient exponent, who lived at that period, had seen, and which, he observes, was ascribed to St. Hilary. In this MS. the Latin arrangement of the Gospels was observed; but this of itself is not sufficient to prove its identity with Beza’s, as 500 years ago there were other Greek MSS. besides the Cod. Cant. in which this order was followed. Besides, Sander has justly observed, that this MS. is Latin as well as Greek; and moreover it contains the Acts of the Apostles, which Drustmar has not related of his MS. Wettstein pretends to have discovered the Cod. Cant. among those which were collated at Alexandria, in 616, for the New Syriac Version, because he found a coincidence in several readings: but it is highly improbable, that a Latin translation would be added to Egyptian MSS. of the New Testament.

As to the place where this MS. was originally written, Simon, Mill, Wettstein, Michaelis, and most other critics, contend that it was written in the west of Europe, where Latin was better understood than Greek, since a translation would have been wholly superfluous, if the MS. had been written when the original language of the Greek Testament was the language of the country. Some have supposed, without sufficient reason, that it was written by a Latin scribe; but this supposition is needful, because it is highly probable, that in Italy or some other part of the west of Europe, where Latin was spoken, and where this MS. was written, Greek forgeries were enmasse, for copying Greek books. This opinion is supported not only by Simon, Mill, Wettstein, Michaelis, &c. but it is likewise defended by Montfaucon, of whom Mr. Marth says, he is one of the best judges of antiquity that ever existed. There is no presumption whatever, a priori, says the ingenious writer just mentioned, against the opinion, that the Codex Bezae was written in the west of Europe; and it is considered highly probable by the two following circumstances: 1. The Latin translation was added with no other view, than as a means of making the original intelligible to those who were not skilled in the Greek; and it was not added merely in consequence of the high authority of the church which used it. For in that case the transcriber would have adopted some established text, from which he would never have deviated; whereas the Latin text of the Codex Bezae is found in no Latin MS. either ancient or modern. It has omissions, inverions, and interpolations, agreeing with the Greek text to which it is added, but differing from all other MSS. whether Greek or Latin. This translation would have been altogether superfluous, if the MS. had been written for the use of a Greek, and still more so, if written in Egypt, as Father Georgi supposes, where Latin was unknown. 2. The gospels, in the Codex Bezae, as we have already observed, are written in the following order, Matthew, John, Luke, Mark; which arrangement was never admitted by the Greek church, or in any country subject to its authority; but it was the common arrangement of the ancient Latin MSS. as appears from the Latin Quadruple, of Blanchin. From all these circumstances it seems reasonable to conclude, that the Codex Bezae was written in the west of Europe, to a country where the Latin was better understood than Greek, and which was subject to the authority of the church of Rome. A MS. written in one country may be sent, transported to another; the Codex Alexandrinus, in the camp of a few years, was in Alexandria, Constantinople, and London; and that the Codex Bezae has been subject to several migrations is not improbable from the various corrections both in the Greek and the Latin texts. Another hypothesis has been proposed, which will solve the several phenomena relative to the Codex Bezae, as easily, or perhaps more so, than the preceding, viz. that it was written either in Constantinople, or in some city of the Greek empire in Europe, for the use of some person or community belonging to the Latin church, between the time of Constantinople, and the final separation of the Greek and Latin churches. During this period, it is probable that many Latin families removed from Italy, and settled in some of the principal cities of Greece; and perhaps whole communities attached to the Latin church excelled in Constantinople for a considerable time after the removal of the seat of empire. It is alleged that the Codex Bezae is exactly such a MS. as we may suppose to have been written for the use either of a Latin community, or some person of distinction, settled in a city of the Greek empire. It was brought perhaps towards the close of the Greek empire from Greece into Italy, where it was collated by Henry Stephens, if it is the same as the codex Stephani, before it came into the hands of Theodore Beza. If we argue from the readings of the Codex Bezae, to the place where it was written, we may conclude, that it was written either in Syria or in Egypt; for in many instances, where it departs from all other Greek MSS. it agrees with the old Syriac, the marginal readings of the new Syriac, the Coptice version, and the quotations of Origen. We need therefore, says Mr. Marsh, make only one addition to the last mentioned hypothesis, an addition which agrees with the opinion of Dr. Sander, and which will solve every phenomenon relative to the MS. in question: viz. that the writer of the Codex Bezae used several Greek MSS. from which he selected those readings which appeared to him to be the best; and that one of these MSS. was the Alex- andrine edition. Sander has instituted a comparison between the Cod. Cant. and the Coptice version, also with the Ethiopic, the Armenian, and the Alexandrinian fathers; and the result of this inquiry is, that the Greek text of the Cod. Cant. belongs to the Alexandrine edition, and that the original from which it was copied was written in Egypt. With respect to the MS. which has been made of Beza’s MS., we have already observed, that Stephens made extracts from it, though with no great accuracy, under the title Codex 2, for the edition of the Greek Testament of 1550, and likewise Beza for his own edition, published in 1582. From his and the CLERMONCOPY of St. Paul’s Epistles, he published in this year his larger annotations. Since it was sent to the university of Cambridge, it has been more accurately collated by Junius. A fourth, and much more accurate collation of it was made at the instance of Usher, and the extracts were inserted in the 6th volume of the London Polyglott. Mill collated it a fifth and sixth time; but that his extracts are likewise frequently defective and sometimes erroneous, appears from comparing them with Wettstein’s New Testament, and from a new collation that was made
about the year 1733 by Mr. Dickensof of St. John's college, which collation is at present in the library of Jesus's college, where it is marked O 6. 2. In Wetstein's extracts are also many errors, as appears from comparing them with the MS. itself. As he took a copy of it, he probably collated, not the original while he was at Cambridge, but his copy after his return. Adler in his "Verzeichnisse Syriaca" has collated the "Verze Syra Hircofolymitana" with the readings of the Cod. Cant. and discovered in it 11 readings, that exist in no other Greek MS. now extant, 14 which are found only in one or two MSS. before the Cod. Cant. and 54 which are common to the Cod. Cant. and several other MSS. For this reason Dr. Harwood, in his edition of the Greek Testament, published in London in 1776, has regulated his text in the Gospels and the Acts, chiefly according to the readings of the Cambridge MS. The copy which Wetstein took of Beza's MS. in 1716, is not the only transcript which has been made of it; for Simon in his preface to the "Éloge Critique du Texte du Nouveau Testament," relates, that he himself had a copy which had been sent him from Cambridge. There is also a third copy which is preserved in the library of Trinity college in Cambridge, and marked B. 10. 3. It is written on vellum, in small characters with accents and marks of aspiration. It is a large quarto, containing only the Greek text. This transcript must have been made some time in the 17th century. In the year 1787, the university of Cambridge resolved to print the whole MS. in letters of the same form and magnitude as the original hand-writing, and committed the publication to the care of Dr. Kipling. Accordingly this facsimile was printed at Cambridge in 1793 in 2 vols. folio, under the title of "Codex Theodori Bezae, Cantabrigiensis Evangeliae et Aeta Apostolorum complectens, quadratis literis, Graeco-Latinus." The price to subscribers was two guineas per vol. This work is printed in a splendid form; the paper is superfine; the type is admirably cut; the ink is of uncommon blackness; and the impression is fearfully paralleled. In these respects it surpasses Dr. Woide's fac-simile of the Alexandrian copy; but whether it does not yield to its Alexandrian rival in other particulars, we leave to the decision of competent judges. It is, however, a very valuable addition to the library of the Biblical critic. See Wetstein's Prolegomena to his folio edition of the New Testament, vol. iii. 278. Katter's edition of Mill's Testament, Proleg. p. 132. Mill Pref. in New Testament, Ambl. 1725. Kipling's Pref. Michaelis's Introd. to the New Testament, by Marth, vol. ii. iii. There are also other MSS. at Cambridge, for an account of which see Michaelis's Introd. by Marth, ibi supra.

CAMBRIDGESHIRE, in Geography, is the name of one of the inland counties of England, having parts of Northamptonshire, Huntingdonshire, and Bedfordshire, on the north-west, with Hertfordshire, and Essex on the south; Suffolk on the east; and Norfolk on the north-east. This tract of the island, with Suffolk and Norfolk, were inhabited, before the defect of the Romans, by a chief of the Britons called Cnomaeni, or Cenomani, one of the nations of the Jeeni. Under the Romans, it formed a part of Flavia Caesaris, and the Saxons made it a part of East Anglia. After various revolutions it was incorporated in Wessex. By the latter people it was called Grantabrygfer, from the river Granta, which waters part of this district. The greatest length of this county is about fifty miles; its greatest breadth at the southern extremity is something more than twenty-five; its circumference is about 138. It contains nearly 443,560 acres, is divided into 17 hundreds, and has one city, ten market-towns, 165 parishes, 16,451 houses, and about 80,000 inhabitants, of whom 28,554 are persons chiefly employed in agriculture, and 11,938 employed in trade, manufactures, and handicraft. The proportion of males to females is 44,581 to 45,265. The limits on the northern half are chiefly rivers and their communicating branches; on the southern, the boundaries are wholly artificial. The principal rivers of Cambridgeshire are the Ouse and the Granta, or Cam. The former enters the county between Fenny Drayton and Erith; thence it runs easterly through the fen, till, at some distance above Denny abbey, it assumes a northerly direction, and passing Streatham, Ely, and Littleport, flows into Norfolk. The latter has three branches, the chief of which rises near Ashwell in Hertfordshire; and enters this county to the west of Gilden-Morden, thence flowing to the north-east, it receives several rivulets; and near Grantchester it has its current enlarged by the united waters of its tributary streams, which flow into this county from Ely. Hence, taking a northerly course, it glides through the gardens of the principal colleges at Cambridge, and having passed several villages, falls into the Ouse at Hatnmore, in the parish of Streatham. Besides these rivers, whose channels appear to have been marked out by nature, there are numerous streams in the northern part of the county, which were suggested by the conveniences, and formed by the industry of man. These interlock the land in various directions; and by carrying off the surplus waters of the fens, have been the means of bringing many thousand acres into cultivation. The chief drainers are the old and new Bedford rivers, which are navigable for upwards of twenty miles, in a straight line across the county from Erith to Denver. A considerable part of the county on the northern and north-western sides, is occupied by the fens which constitute a part of the great Bedford level. It appears from the agricultural survey of the county, that upwards of one third of Cambridgeshire, or 150,000 acres, are still in the condition of waste and unimproved fen, the average value of which is little more than four shilings an acre. This is a full proof that the immense labour employed in the draining of the level, has not been attended with the salutary effects which the promoters of the various plans too fondly imagined. The towns and villages in the northern division of the county are from the elevated spots on which they are built, appear like islands rising from the midst of low and level marshes; and the churches, being generally on the highest parts, may be distinguished at the distance of several miles. The cottages are in many places nothing more than mud walls covered with thatch. The application of the land is various. In those parts which have been preserved from the floods, or are only subject to occasional overflows, it has all the fertility of water meadows. The crops of oats are particularly exuberant, the produce being frequently from forty-five to sixty bushels an acre. Great quantities of wheat and col-seed are also grown, and generally with a proportional increase. Many thousand acres, particularly on the north-western side, are appropriated to paffure. In the neighbourhood of Elm, Upwell, Outwell, &c. considerable quantities of hemp and flax are grown; but the culture of these articles, as a preparation for wheat, does not receive that attention which their importance demands. Some very fine butter is made on the dairy farms in this district, and is usually sold in the Cambridge markets in long rolls, called "yards," one of which weighs a pound. The vicinity of Cottenham is famous for a peculiar kind of new cheeses, of a singularly delicious flavour; the superiority of which is partly ascribed to the mode observed in the management of the dairies, and partly to the nature of the herbage on the commons. To this part of the county many calves
Cambridgeshire is greatly diversified. The rich marshes in the vicinity of Wisbech, consist of a mixture of sand and clay, or silt; in the fens, of a strong black earth, or moor, lying on a gault or gravel, or turf-moor, and very favourable for the culture of oats and cole-feed; in the uplands, of chalk, gravel, loam, and tender clay, and clay upon a gault. The common manures are sometimes aided by the application of oil-cake dust, pigeons' dung decayed, woollen rags, foot, &c. The drill husbandry, till lately, had been chiefly employed at Wimpole, on the estate of Lord Hardwicke, but appears to be fast spreading, and, with the introduction of some new agricultural machines, promises to become of essential service. The rent of farms is generally from 50l. to 350l. per annum; but some in the neighbourhood of Wisbech rent as high as 800l.; and one in the parish of Wood Ditton, is occupied at the rent of 1000 guineas yearly. The wood-lands are extremely small, the whole quantity appropriated to timber throughout the county scarcely amounting to 1000 acres, and these principally scattered through the parishes of Stacheworth, Wood Ditton, Linton, Barlout, Boxworth, Wimpole, and Madingley. The greatest part of the land is open field; but inclosures are rapidly taking place, new bills for that purpose being applied for, and obtained every session of parliament. Manufactures are barely known in this county; and, with the exception of those persons who obtain subsistence by making the celebrated white bricks, and coarse pottery with the same clay, in the neighbourhood of Ely, most of the inhabitants are employed in agriculture: others derive support from spinning yarn for the Norwich weavers. Cambridgeshire, with the exception of a few parishes on the east and north-east side, which belong to the fees of Norwich and Rochefort, was taken from the see of Lincoln, by Henry the First, in the year 1114, and made into a separate diocese for the newly elected bishopric of Ely. It sends six members to parliament, viz. two for the shire, two for the town of Cambridge, and two for the university; pays nine parts of the land-tax, and supplies the militia with 450 men. It is included in the Norfolk circuit.

Cambrin, a town of France, in the department of the fruits of Calais, and chief place of a canton, in the district of Bethune; the place contains 402, and the canton 17,886 inhabitants: the territory comprehends 90 kilometres, and 16 communes.

Cambrisopolis, in Ancient Geography, an episcopal town of Asa, in the patriarchate of Antioch, and subject to the metropolis of Anazarbus.

Cambro-British Music, national Welsh tunes. These ancient melodies, which till the eleventh century seem to have been traditional, after that period, were preferred in writing. See Jones's Musical and Poetical Relics of the Welsh Bards. These airs have a peculiar character, different from the Scotch and Irish, and are in high estimation with the natives, who have not yet forgiven the Saxons for driving them into the mountains, nor the English for slaying their fards, and robbing the principalities of its independence. Most of the words which they sing to their old tunes, are narratives of their struggles for liberty.

Camula, in Botany. (Rheed.) See Bignonia catalpa.

Camburg, in Geography, a town of Germany, in the circle of Upper Saxony, and principality of Altenburg; 28 miles W. of Altenburg, and 54 S.W. of Leipzig.

Cambus, in Ancient Geography, a river of Vindelicia, which commenced S. of Cambodunum, watered this town, and discharged itself into the Danube to the west of Gauntia.

Cambusum ostium, the name given by Polyeucte to the most western mouth of the Ganges.

Cambuvi montes, mountains of Greece in Macedonia, mentioned by Livy, who says, that the inhabitants of the country were called Volubantes. He places them below the source of Ajaxmon and near Panyasis. These mountains separate the Elymiote territory from Pelagonia.

Cambyse, a country of Albania, between the rivers Cambyses and Cyrus, and the mountains, according to Strabo. This was one of the prefectures of Armenia.

Cambyses, in Biography, king of Persia, was the son of Cyrus the Great, and succeeded his father in the year B. C. 529. As soon as he was seated on the throne, he concerted an expedition against Amasis, king of Egypt, who, as some say, had deceived him with respect to the grant of his daughter in marriage; or, according to others, because he refused, after the death of Cyrus, to pay the same homage and tribute to his successor, which he had agreed to render to Cyrus, and attempted to emancipate himself from the Persian yoke. Cambyses made great preparations for this expedition both by sea and land: but Amasis died in the inter. v. of four years, and was succeeded by his son Pharnamnus. Cambyses began with the capture of Pelopon; and in order to secure his sucesors, had recourse to the following stratagem. Being informed that the whole garri- son consisted of Egyptians, he placed in the front of his army a great number of dogs, sheep, and other animals, which were deemed sacred by that nation, and then formed the city. The soldiers of the garrison not daring either to fling a dart or shoot an arrow for fear of injuring some of these animals, Cambyses became master of the place without opposition. In a subsequent battle with the army of Pharnamnus, he proved victorious, and took the king captive. Having pursued the fugitives to Memphis, he soon took the place, and because the inhabitants had massacred the he- rald and his retinue, whom he had sent to require their surrender, he cafted as many of the prime nobility as they had destroyed to be publicly executed; and he ordered Pharnamnus to be put to death. Upon this Egypt submitted to the conqueror; and the Libyans, Cyrenians, and Barceans sent ambassadors with presents to testify their submission, and to conciliate his favour. At Sais, which was the burying place of the kings of Egypt, he cafted the body of Amaa- lis to be taken out of its tomb, and having exposed it to various indignities, he ordered it to be burnt, in direct oppo- sition to the customs of the Persians and Egyptians. In the following
following year, which was the sixth of his reign, he deter-
mined to make war against the Ammonians and Ethiopians,
and leaving his Greek auxiliaries to secure his conquests, he
pursued the object of his expedition. As soon as he arrived
at Thebes in Upper Egypt, he sent a detachment of 50,000
men against the Ammonians, with orders to ravage the
country, and to destroy the famous temple of Jupiter Am-
on; but in their passage through the desert they were
overwhelmed by a deluge of sand and totally destroyed.
Cambyses himself advanced with the main body of his army
towards Ethiopia; but as he had neglected to provide nec-
essary subsistence for his numerous followers, they were
soon reduced to the most dreadful indigence and distress; so
that, after having devoured all their beads of burden, and
every kind of vegetable which they could find, they were
under a necessity of sacrificing every tenth man as food for
their companions. The king, however, for some time per-
fixed in his mad design; but at length apprehensive of per-
ditional danger, he returned to Thebes with the shattered rem-
nant of his large host. Here, irritated by his disappointment,
he pillaged the rich and magnificent temples of the city, and
set them on fire; and it is said that their wealth was such,
that the remains that were saved from the flames, amounted
to 5,000 talents of gold, and 2,000 talents of silver. He like-
wise carried away the famous circle of gold that encompassed
the tomb of King Ozymandias, which is reported to have been
255 cubits in circumference, and to have exhibited the
motions of the several constellations. From Thebes he re-
turned to Memphis, where he indulged to its full extent his
naturally ferocious and savage disposition, by destroying the
Egyptian priests, and the worshippers of their god Apis,
and killing this sacred ox. To this outrage against humanity
and the rites of their religion, the Egyptians attributed his
subsequent infamy: but his general conduct both before and
after this event, afforded sufficient evidence of his de-
velopment and cruelty. Jealous of his brother Smerdis,
he ordered him to be put to death; and he then married his
own sister, Meroe. Having previously consulted the Persian
judges, whether any law sufficed that forbade this incestu-
ous marriage, they, disapproving of the act, but at the same
time fearful of the king's violent temper, returned this arti-
ful reply: "That they had no law indeed which permitted
a brother to marry his sister, but that they had a law which
allowed the king of Persia to do what he pleased." This
beautiful and beloved wife taking occasion to refer to the
fate of her brother Smerdis, excited the rage of this brutal
prince, so that he killed her, though in a state of preg-
nancy, by a kick in the belly. Another savage act of which
he was guilty, was that of shooting to the heart the son of
one of his principal officers and favourites, who had in a de-
licate manner reproved him for his intemperance. Having
taken out the heart, which the arrow had pierced, he pre-
mented it to the father, and asked him in an insulting
manner, "have I not a steady hand?" to which the abject
parent replied, "Apollo himself could not have shot better."
"Scleratus," says Seneca, after reciting this story from
Herodotus, "tehun illud landatum ets, quam mihiu." About
the same time, he caufr several of his principal fol-
lowers to be buried alive, and daily sacrificed some or other
of them to his wild fury. Croesus, who renounced against
these proceedings, was ordered to be put to death; and
those who delayed executing the royal mandate, under a
conviction that the king would repent of it, were ordered to
be slain, because they disobeyed his command, though at
the same time he expressed his joy that Croesus was alive.
In consequence of these and similar proceedings, a conspi-
ruous conspiracy was formed, during the absence of Cambyses from his
own country, for seizing the throne, by Smerdis, one of the
Magi, under a pretense that he was that Smerdis whom his
brother had caused to be put to death. Cambyses received
this news whilst he was in Syria, on his return from Egypt
to Persia; and on this occasion the name of Smerdis excited
composition and terror, whilst he recollected the fratride
he had committed. He prepared, however, for cutting off
the usurper; but as he was mounting his horse for the ex-
pedition, his sword dropped out of its sheath, and gave
him a wound in the thigh, which occasioned his death in the
eighth year of his reign, B. C. 522. Cambyses is supposed
to be referred to in Scripture, under the name of Am
ii. 177.
Cambyses was also the father of Cyrus, who is said by
Herodotus to have been a Persian of mean extraction; but
by Xenophon to have been a king of Persia. He married
Mandane, the daughter of Astyages.
CAMBYES, in Ancient Geography, a river of Albania,
which rose in mount Caucasus, and discharged itself, after
pursuing its course between the Albus fluvius and the Cyrus,
into the Caphian sea.
CAMBYSUS, a town situate on the Red sea, in the gulf
of Hercules, near the place where the Phœnicians passed this sea
under the conduct of Mopses. Piny says that it was
situated between Neus and Marcladas.
CAMDEBOO, in Geography, a loan-farm in the district
of Graaf Reinet, in Southern Africa, which extends along
the feet of the snowy mountains from the Dorddy to Bruynjes Hoogte, and is chiefly composed of Karroo plains,
that are, however, extremely fertile in the plains, down
which the streams of the mountains constantly flow. The
ore are large and strong, and the sheep little inferior to
those of the snowy mountains. The beautiful animal, the
Gna, is frequently seen bounding over the plains of Camde-
bo, and spring-boks and harte-beests are very plentiful.
CAMDEN, William, in Biography, an eminently
learned antiquarian and historian, was born in May, 1551,
in London, where his father, a native of Litchfield in Staff-
ordshire, was a member of the company of painter-flinters.
His mother was of the ancient and respectable family of the
Curwens in Cumberland. After having received the first
rudiments of his education in Christ's hospital, and at St.
Paul's school, where he made a very conspicuous proficiency,
he was entered as a servitor in Magdalen college, Oxford,
at the age of 15 years; and became successively a member
of Broadgate hall (now Pembroke college) and of Christ-
church, according to his support chiefly on the kindness
of friends, and more particularly on that of his liberal patron,
Dr. Thornton, canon of Christ church. Failing by the in-
trigue of the popish party to obtain a fellowship in the college
of All-Souls, and to be admitted bachelor of arts, he re-
moved to London, and prosecuted his studies under the pa-
tronage, and by the assistance of Dr. Gabriel Goodman, dean
of Wellminster, and his nephew, Mr. Godfrey Goodman,
who supplied him with both money and books. In 1573
he returned to Oxford, and obtained the degree which he
had before unsuccessfully solicited. By the interest of his
friend dean Goodman, he was appointed, in 1575, second
master of Wellminster school, and discharged the duties of
that office with great diligence, capacity, and success, so that
he acquired a high degree of reputation among learned per-
sons both at home and abroad. His leisure hours at this
time were devoted to his favourite study of antiquities; and
with
with a view to the great work which he afterwards executed, he
began to make collections from every source of information
with which he could have access, of such materials as might
serve to illustrate the history and antiquities of Britain.
For this purpose he made a tour, in 1583, through some of
the southern and northern parts of the kingdom, and he also
established a correspondence with persons most esteemed for
their learning and judgment, both in his own country and in
other nations. The first result of his researches appeared in
1586, under the title of "Britannia, five Florentinorum
Regnorum Angliae, Scotiae, Hiberniae, et Infidelarum adjunctum
ex antiquata Antiquata Chronographica Descriptio," i.e.
"Britain, or a Chronographical Description of the most
flourishing Kingdoms of England, Scotland, and Ireland, with
the adjacent islands, from the remotest Antiquity." Lond.
5vo. In the dedication of this work to lord-treasurer
Burleigh, Camden gratefully acknowledges the benefits he
had derived from his patronage and intelligence. For the
further improvement of this work, which was one of the great
objects of his life, he took journeys into the west of
England, and moved also into Wales in 1589 and 1590; he
visited the archives of the kingdom; and he obtained the best
information he could procure with respect to the genealogies
and memoirs of ancient families; and he thus enlarged and
enriched the subsequent editions of his "Britannia," which
became so popular, that the fourth was printed in 1594, in
4to. In the preceding year he succeeded Dr. Edward
Grant, who resigned the office of head-master of Westminster
School. Notwithstanding his professional engagements, and
his ill health, he employed the intervals that occurred in
journeys of research and discovery, pertaining to his main
object. He also paid due attention to his office as an instructor
of youth; for in 1597 he published, for the use of his school,
a Greek grammar, which, though not an original work, but an
abridgment of a copious one, composed by his predecessor,
Dr. Grant, was highly approved, and long continued to be a
standard book. In 1601 this grammar, entitled "Grammaticæ
Greci Instructio compendiaria in usum Regis Scholæ
Weilminialis," 5vo, had passed through nearly 100
impressions. Camden seems to have been so much attached
to his profession, in the exercise of which he was highly
esteemed and respected, that, though he was offered the place
of a master of requests, he declined accepting it. But
when by the intercess of Sir Fulke Greville, the vacant post of
Chancellor of arms was conferred upon him, this office was
so congenial to his taste and preferment, that he
fo much relished in prosecuting his favourite studies, that he
surrendered his connection with Westminster school. As he
was now more at liberty than when he had the charge of the
school, he took a journey, in 1609, into the north, as far as
Carlisle, with his friend Mr., afterwards Sir, Robert Cotton;
and in the same year he published an account of all the
monuments in Westminster abbey, with their inscriptions, &c.
In this year also appeared the fifth edition of the "Britannia,"
with an apology annexed to it, containing a reply to the
objections urged against it by Rafe Brooke, York-herald.
In 1603 Camden cauful to be published at Frankfort, in folio,
a collection of our ancient historians; some never before pub-
lished, and others rendered more accurate and complete,
under the title of "Anglica, Normanica, Hibernica, Cam-
brica, à Veteribus decripta, &c." and in 1605 appeared
his "Remains of a greater Work concerning Britain, the
Inhabitants thereof, their Languages, Names, Surnames, Em-
prellies, wife Speeches, Poeties, and Epitaphes," Lond. 4to.
The work was dedicated to his much valued friend and
patron, Sir Robert Cotton; and with a view of ending such
attacks as had been made upon his "Britannia," he depre-
cipates this collection, calling it "the most of a greater
and more furious work, the unpleasant and illiberal
whereof would secure it from envy, which only reaches at
enclosure." Accordingly, he subjoined it only with the final
letter of his name. But we have reason to believe, that, in reality,
he did not think mainly of this collection, dedicated to one
of his best friends, and a competent judge of its contents;
and well received by the public, as it passed through several
editions. Camden also composed many brief essays on Brit-
ish antiquities, chiefly at the request of the Society of Anti-
quarists, of which he was a member. Those that are still
extant may be found in the collections of Thomas Hearne.
In 1604 a correspondence commenced between Camden and
the famous president De Thou, which continued for 11
years, till the death of the latter, and in the course of which
the former communicated many useful notices concerning
the affairs of Great Britain. On the discovery of the gun-
powder plot, Camden was employed by king James to draw
up an account of it in Latin, for the information of for-
ereigns; and this service was performed by him in a fusti-
neous manner. It was published in 1607, 4to, by the
king's printer, in Latin, Greek, and Hebrew; and not long
after it was translated into both of prohibited books by the
inquisition. In this year he was confined for several months
in consequence of an injury received by a fall from his horse;
and he employed this time in preparing for the press and
publishing a final and complete edition in folio of his "Brit-
nia." It was this edition that occasioned him to be disting-
ushed as the "Varro," the "Strabo," and the "Pausa-
nias" of Britain; and it was from this edition that the
English translation of Dr. Philenom Holland was made
in 1614, and others of later date. The "Britannia" remains
to this day a standard work; and the translations of it in the
successive editions of bishop Gibson, first published in 1699,
and of Richard Gough, c.q. published in 3 large vols. folio
in 1789, have been swelled by corrections and additions to
books of great bulk and importance. Camden, with a mind
discharged from constant attention to what may be denomi-
nated his "Opus magus," began, in 1668, to digest the
materials which he had been long collecting for a history of
the reign of queen Elizabeth, to which he had been first
excited by his old patron, the lord treasurer Burleigh.
Whilst he was prosecuting this work, a prospect of new prefer-
ment, as one of the professors of history in a new college of
domains, proposed by Dr. Sutchile to be erected at Chelsea,
presented itself; but the institution, though patronized by
king James, was never establlished. He therefore directed
his whole attention to the completion of his history, the first
part of which, after having been approved by king James,
was printed in 1615, under the title of "Annales Rerum
Anglicarum et Hiberniarum regniæ Elizabethæ et Annum
Salutis, 1599," Lond. fol. The reputation of the author
both at home and abroad was much advanced by this publica-
tion; but it did not escape animadversion; and his represen-
tation of some transactions, particularly those relating to
Ireland, drew upon him some virulent attacks, to which,
however, he made no reply. He cloes his preface, in which
he gives an account of his sources of information, and of his
reason for entitling his history "Annales," with this memo-
orable declaration: "Whatever it be, I dedicate and con-
secrate it at the altar of truth, to God, to my Country, and
to P拱ority." The animadversions made on the first volume
discouraged the author from proceeding to publish the second
part during his life; and, therefore, after finishing it in
1617, he kept the original by him, which was preferred in
the Cotton library, and sent an exact copy to his friend
Mr. Dupuy, who faithfully executed the order for publishing
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it after his death. This history, at and after the time of its publication, has undergone some severe strictures. Some of the most candid judges, who have thought it, upon the whole, a valuable historical composition, have been of opinion, that it contains too favourable a representation of the reign of queen Elizabeth. Le Clerc, in his "Bibliothèque Choix" (tom. S. p. 159. 158.), has made some observations on what Camden has said concerning Buchanan, and Mary queen of Scots, and has shown, that those parts of his work are written under the influence of prejudice or misinformation. He farther intimates, that Camden was misled by the good opinion he entertained of king James I. and his zeal for his service; and it appears, that his submissive loyalty led him to pay a regard to the judgment of his prince, to which it was not entitled. Dr. Robertson also observes (Hist. of Scotland, vol. ii. p. 388, &c.), that Camden's representation of some important transactions relative to queen Mary are very ill founded, and that this part of his history is less accurate than any other. Hume, however (Hist. of England, vol. vi. p. 195, &c.), says, that "Camden's history of queen Elizabeth may be esteemed good composition both for style and matter. It is written with simplicity of expression very rare in that age, and with a regard to truth. It would not perhaps be too much to affirm, that it is among the best historical productions which have yet been composed by any Englishman."

After the completion of his history, Camden passed his time in literary leisure and in the exercise of his heraldic office; his summers were generally spent at Chicheleirull in Kent, and his winters at his house in Welfington. One of the last acts of his life was that of founding a history-lecture at Oxford; for the support of which he appropriated the valuable manor of Bexly in Kent, which he made over to the university in 1622: and he appointed Mr. Degory Whare to be the first professor. For this establishment the university, which had been slow in conferring favours upon him, when a young man, honoured him, after his death, with singular testimonials of respect. Camden died at Chicheleirull in November, 1623, in the 73d year of his age, and was buried with great heraldic pomp in Welfington abbey, near the learned Cafaubon, and over against the celebrated Chaucer. Near the place was erected a monument of white marble, with his effigies to the middle, and in his hand a book with "Britannia" inscribed on the leaves; under which there is an elegant inscription. As an antiquarian, Camden's character has been long established; so that he may be justly reckoned as the father of British antiquities, and the materials which he collected have served as a basis for the accumulation of further knowledge on the subject. His merits as an historian have been already stated. For the elegancies of literature he is said to have had a taste, so that he wrote Latin verse with purity and harmony. Bishop Gibson, in his life of Camden, has given a concise sketch of his character in the following words: "In his writings he was candid and modest, in his conversation easy and innocent, and in his whole life even and exemplary." But neither his extensive learning, nor his high reputation, could defend him from the envy of his enemies while living, or his memory from insults after his death. Biog. Brit.

Camden, in Geography. See Camden.

Camden, or Camden, a county of North America, in Edenton district, North Carolina, situate in the N.E. corner of the state. It has 4053 inhabitants, including 1038 slaves. Its chief town is Jonesborough.

Camden, a district of the upper county of South Carolina, bounded by Cheraws district on the N.E., Georgetown district on the S.E., and the state of North Carolina on the N., and divided into the following counties, viz. Clarendon, Richland, Fairfield, Laurens, Lancaster, Kershaw, and Salem. It is 82 miles from N. to S. and 203 miles from E. to W., and contains 38,265 inhabitants, including 8355 slaves. It is watered by the Wateree, or Catahaw river, and its branches: the upper part is variegated with hills, generally fertile and well watered. It produces Indian corn, wheat, rye, barley, tobacco, and cotton. The Catahaw Indians live in the northern part of this district.

Camden, the chief town of Camden district, in South Carolina, is seated on the E. side of Wateree river, 35 miles N.E. of Columbia, 55 S.W. of Cheraw, 120 N. by W. of Charleston, and 623 S.W. of Philadelphia. It is a regular town, and contains about 120 houses, an episcopal church, a court-house and jail. The navigable river on which it is situated, enables it to carry on a brisk trade with the back country. N. lat. 34° 20'. W. long. 86° 31'.

Camden, a county in the lower district of Georgia, at the south-east corner of the state, on St. Mary's river, containing 325 inhabitants, of whom 70 are slaves. The chief town is St. Patrick's.

Camden, a small town on the western side of Penobscot bay, in the district of Maine, and the south-easternmost township of Lincoln county, having Thomas-town on the S.W.; 35 miles N.N.E. from Pownalborough, and 28 miles N.E. from Bolton. Also, a village in the county of Kent, and state of Delaware, about four miles S.W. from Dover, and five north-westly from Frederica.

Cambridge. See Cambridge.

Camechia, in Ancient Geography, the name of a town in Albania, mentioned by Ptolemy.

Camehuia. See Camehuia.

Camei, in Geography. See Alan and Camelford.

Camel, mount, lies on the W. coast of New Zealand, in the South Pacific Ocean, and is remarkable on account of the land that is contiguous to it being mostly low and barren; and as it is near the north end, it is seen in almost every direction, the island being, in this part, very narrow. The observed latitude is 34° 20' S.

Camel, in Mechania, a kind of machine used in Holland for raising or lifting ships, and invented by Bakker, a burgomaster of Amsterdam, in the year 1665, or 1669. It took the denomination from its heaviness or strength. Its use is to raise vessels, in order to bring them over the Pampus, which is a passage between two sand-banks, opposite to the mouth of the river Y. about six miles from the city of Amsterdam, where the shallows of the water hinder large ships from passing. On this account, vessels which are outward-bound, take in before the city only a small part of their cargo; and they receive the rest when they have passed the Pampus. For the same reasons, those which are homeward-bound, must, in a great measure, unload before they enter it. Many measures were adopted to prevent the accumulation of sand in this passage; but they were ineffectual. About the year 1672, they had no other remedy for this evil besides that of fastening to the bottoms of ships large chaff filled with water, which was afterwards pumped out, so that the ships were buoyed up, and rendered sufficiently light to pass the shallow. By this method, the Dutch carried out, with the utmost difficulty, their numerous fleet to sea in the above-mentioned year. This plan, however, gave rise, soon after, to the invention of the camel, by which the labour was much facilitated. This machine consists of two half-ships, built in such a manner that they can be applied, below water, on each side of the hull of a large vessel. On the deck of each part of the camel
There are a great many horizontal windlasses, from which ropes proceed, through openings, in the one half, and being carried under the keel of the vessel, enter similar openings in the other, from which they are conveyed to the windlasses on its decks. When they are to be used, as much water as may be necessary is allowed to run into them; all the ropes are called hawses; the vessel is conducted between them; and large beams are placed horizontally through the port holes, with their ends resting on the camel, on each side. When the ropes are made fast, so that the ship is secured between the two parts of the camel, the water is pumped from it; and it then rises, and raises the ship along with it. Each half of the camel is generally 127 feet in length; the breadth, at the one end, is 22 feet, and at the other, 13. The hold is divided into several compartments, that it may be kept in equipoise, while the water is flowing into it. An East India ship, that draws 15 feet of water, can, by the help of this machine, be made to draw only 11; and the heaviest ships of war, of 90 or 100 guns, can be so much lightened as to pass without obstruction, all the banks of the Zuyder-Zee.

Leopold ascribes the invention of this machine to Cornelius Meyer, a Dutch engineer, who, towards the end of the 17th century, was invited to Rome by the Apostolic chamber, to cleanse the Tiber, and render it navigable. In a work entitled "L'Arte di Trarre a Roma la tribolita," Navigatione del fiume Tevere," Rom. 1684, fol. and describing his inventions, he proposes a method for carrying large ships over shallows, which bears a considerabe resemblance to this in which the camel is employed; for he says, that a vessel must be constructed in such a manner as to embrace the hull of the ship, like a caft; and that when placed under the ship, it will raise it up. But though this machine of Meyer is founded on the same principles with those of the camel, it is different, as confides of one piece, and can be placed under a ship only in a dock, by the help of a number of screws. It does not appear that Meyer's machine was ever tried or exhibited. On the other hand, we are assured, on the testimony of Eckker, the original inventor of the camel, recorded in 1692, and still preserved, that in the month of June, when the water was at its usual height, he conveyed, in the space of 24 hours, by the help of his machine, a ship of war, 150 feet in length, from Enkhuizen hove to a place where there was sufficient depth; and in 1693, he raised a ship 80 feet by the help of this machine, and conducted her to a place of safety. At later periods, the Dutch invention has been employed in other countries. The Russians use camels to carry ships over the shoals that are formed in the Neva; and they have them of various sizes. Bernoulli saw one, each half of which was 217 feet in length, and 30 in breadth. Camels are likewise used at Venice. Ships of war, however, to which this machine is applied, must unavoidably sustain injury; and it is well known, that the parts of a ship which had been raised by the camel, were so much strained, that the vessel could not afterwards be closely fitted. The principle upon which this machine acts, so as to answer the purpose, is that of specific gravity. Mifschenbroek's Instr. ad Phil. Natur. vol. ii. p. 317, &c.

**CAMEL** in Zoology. See CAMELUS.

**CAMEL-livestock.** See Alpaca.

**CAMEL-SEED.** in Botany. See Andropogon.

**CAMELANTHUS.** in Ancient Geography, a people of Italy in Umbria, who, according to Hardouin, inhabited the town called Camalantum.

**CAMELON.** in Zoology. See CAMELON.

**CAMELEON.** in AJfrology, one of the con-...Vol. VI.

CAMELEON, in Zoology. See CAMELEON.

**CAMELEON.** in Ajirology, one of the con-...Vol. VI.

CAMELEON, in Zoology. See CAMELEON.

Fellatio of the Southern Hemisphere, near the poles, and invisible in our latitude. The bars in this constellation, according to Sharp's Catalogue, are ten.

**CAMELFOORD, in Geography,** is a very ancient, but inconvenient borough-town of Cornwall, England, situated in a dreary, bleak, and almost desolate part of the country; like most of the Cornwall boroughs, it has formerly any obligation to public notice, than the privilege of returning two members to parliament. These are derived from the mayor, burgesses, and freemen, which do not exceed 20 persons. It began to send members in the reign of Edward VI., and this liberty was confirmed by Mary. It was made a borough by a charter from Richard Duke of Cornwall, (when he was king of the Romans,) who granted it a market and a fair. Their privileges were afterwards confirmed by his brother Henry III. It was incorporated by Charles I. The whole town contains only 100 houses; and the parish-church is at Lanteglos, about one mile distant. This neighbourhood has, been, according to the statement of many historians, the theatre of two desperate battles; one between the Britons and the Saxons, and the other between the famous British Pen-dragon, Arthur, and his nephew Modred, or Medravol, who, after an adulterous intercourse with Arthur's queen Genuona, rebelled against his uncle, and fought to deprive him of his kingdom. The battle lasted several years, and various battles were fought; but the decisive conflict at length occurred at Camel, (probably Caben-alan, the crooked river,) where, after two days' engagement, with unconquerable slaughter, Modred was killed, and Arthur himself mortally wounded. See CAMEL. The site of the battle is disputed by different historians; though, from some local circumstances, we are inclined to fix it near the village of Camel, which is within eight of Cliftonbury Abbey, in Somersetshire. Camelford is 22 miles west from London; and has a market on Friday.

**CAMELIDES.** in Ancient Geography, islands of the Mediterranean Sea, on the coast of Ais Minor. Pliny places them on the coast of Ionia, in the vicinity of Miletus.


**CAMELINA.** (Myagrum alterum. Lob. li. 225.) See Exymium Cheiranthoides.

**CAMELIO-MAGUS.** in Ancient Geography, a place of Italy, in the northern part of Liguria, to the west of Placentia.

**CAMELITA.** Bos, in Zoology. See BISON.

**CAMELIA.** in Botany. (named in honour of George Joseph Kamel, a Jesuit, whose name has been latinized into Calemmus. He is the author of Syllabus Stirpium in indica Lusone Philippianum, annexed to the third volume of Ray's Historia Plantarum) Linn. gen. 848. Schreb. 1145. Wolf. 1322. Just. 243. Vent. 243. Clafl and order, monardapii pentandria. Nat. ord. CAMELLIF. Just. Flora Venet. Vent. Cam. Ch. Cale. prietis, many-leaved, imbricated: leaves roundish, very blunt; the inner ones gradually larger, deciduous. Cam. petals five to seven, large, inwardly clefted, adhering at the base. Stam. filaments numerous, erect, coalescing below into a crown larger than the style, unconnected above, shorter than the corolla; anthers simple, Fil. four roundish, style awl-shaped, the length of the calyx: Diam. from three to five, acute. Paris, top-shaped, woody, furnished, with many cells as furrows, separated by very slender partitions. Seeds: nuts one or two in each cell.

coloured bark; branches round and smooth. Leaves alternate, egg 
shaped, acute, shining on both sides, thick and 
flufh. pider green beneath, on short petioles. Flowers large, 
beautiful, those of the plants which have been raised in Eu-
rope, lively red, but in their native country they exhibit a 
variety of colours, nearly effeile, generally solitary, but some-
times two or more together; petals thickish, uniting at the 
bottom into a tube full of nectaruous juice; flabums about 
fty. Stigma unequally five-cleft. Its flowers readily be-
come double, in which fiate they often occur in Chinese 
paintings. A native of China and Japan, introduced into 
England before 1743 by Robert James lord Petre. It was 
for a long time very scarce, and as it bore a high price, was 
generally treated as a love plant, but Mr. Curtis obferves, 
that it appears a very proper plant for the conftervatory, and 
may hereafter, probably, be treated as a hardy or mag-
nificent. It is propagated either by layers or cuttings. Po-
fer confidered it as a species of tea-tree, to which it is cer-
tainly nearly allied. 2. C. f egregious, Thunb. jap. 273. 
Kämpf. amm. 857. “Leaves obliquely serrated, emargi-
nate.” A tree of a middling size. Stem, much smaller, and 
more flender than that of the preceding species. Leaves 
thinner and narrower. Flowers many times smaller, fo-
itary, terminating the branches; calyx of five or six leaves; 
petals from five to seven, white, deciduous. The leaves 
dried in the shade have a fweet fme, and are mixed 
with tea to give it a grateful colour: a decoction of them is 
used by the women to wash their hair with. This species 
so refeembles the tea-plant, that it is diftinguifhed chiefly by 
the cooeifing flabums, and this, as Thunberg obferves, is 
scarceiy a fufficient mark of diftinftion, since the flabums 
coeeif only at the falt; and fometimes feem to be difluft. 
A native of Japan. The Chinese call this plant “ Cha-
wha,” or flower of tea. It yields a fnut, from which is 
expressed an effefulent oil, equal to the belch which comes from 
Florence. On this account, it is cultivated in great 
abundance; and is particularly valuable from the facili-
ty of its culture in situations fit for little elfe. See vide 
George Smatton’s Embafly to China, vol. ii. p. 467. He 
has given a drawing of the plant. 3. C. duffifera, Linn. 
Cochin. 141. “Leaves oblong-egg-shaped, fhrly fteel-
flipped; flowers two or three together, terminating; decaf-
feled.” A middle sized tree with spreading branches. 
Leaves acuminate, smooth, hard, small, alternate, petioled. 
Flowers white; petals eight, oblong, emarginate; fufe 
quadrid, the length of the flabums. Drupe roundifh, with 
a grooved, four-celled nut, and roundifh kernels. The fruit 
is equal in size to the walnut, and is not much unlike it, 
but is not efeculent. The oil expreffed from the nuts is fed 
by the natives to anoint their hair, and for various medical 
purpofes; it has a pleafant odour, and does not foon be-
come rancid. A native of Cochin China. This plant is taken 
up by profeflor Martyn as a camellia, from Loureiro; 
but Bofe afferts, that its botanical characters are far 
remote from thofe of this genus, and with his ufual par-
simoniafufcifs, gives no further obfervation on this sub-
ject.

CAMELOBOSCI, in Ancient Geography, a people of Asia, 
placed by Prolemy in Carmania, and furnamed Soszte.

CAMELOPARDALIS, in Zoology, a genus in the 
Pecora order of Mammalia, defcribed by Gmelin, upon 
the authority of late writers, for the reception of that cur-
ious animal the Giraffe, or Camelopardi. The character of 
the genus, as laid down by this author, consists in having 
the horns very fimple, covered with fkin, and terminated by 
a tuft of black hair; the floe teeth in the lower jaw eight 
in number, broad, thin, and the outer one on each side 
deeply bifolute.

Linnaeus describes this creature in the twelfth edition 
of his Syftema Natufre, as a kind of cervus, or deer, under 
the specific title of Camel-pardalis; a name by which it was 
known among the earlier Latin writers, as Strabo and Op-
pian. Linnaeus was not fingular in confidering the giraffe 
as a fort of cervus; he had the example of Gfner, and other 
nomenclators before him. Gfner affirms (as he tells us), on 
the credit of Belon, one of the earlieft among modern na-
uralists, who has attended particularly to this animal, 
that the giraffe feeds his horns like the deer. Buffon com-
plains that no fuch pagaffe as Gfner quotes is to be found 
in any part of Belon’s works; but be this as it may, Lin-
naeus was miffed by this and other accounts of the animal 
to believe it must be of the deer kind. Since the time of Lin-
naeus, naturalists are become better acquainted with this ani-
mal; it has been beftowed, that the horns are not deciduous 
as in the deer, or at leaft there is every reason to think 
they are not. Thofe horns are of a texture altogether dif-
derent, not only from thofe of the animals of that kind, but 
from all the other known kinds of horned quadrupeds. Ana-
atomists obferve, that these horns are only porous bony 
excreaces, forming, as it were, a part of the ffful, a pretty 
strong proof that they are not deciduous, and cannot be fied 
lke the horns of the deer.

From the flereme of these horns, and the peculiar ar-
 rangement of the teeth, it is clear the giraffe is an animal of 
another genus diflinct from that of cervus, in which Lin-
naeus places it. Gmelin removes it from the cervus genus 
in the lat edition of the Syftema Natufre, to that of Camelo-
pardalis, where it stands at prefent a foltary example of this 
curious genus.

One of the latest and most fatisfactory defcribers of the 
giraffe is M. Vaillant. The discoveries of this ingenious 
writer, who, in the progres of his travels through Africa, 
had frequent opportunities of feeing them in their native 
haunts, has thrown new light upon their history. His ob-
ervations are interefling, and he has, besides, rendered 
an important fervice to fcience by enricbing one or two of the 
principal muufums of Europe with fpecimens of the animal; 
from whence the naturalift is enabled to form his own op-
inion of this remarkable animal, unfupported by the reports of 
inattentive obfervers, or the imperfect details of former tra-
vellers. A fpecimen of the giraffe, in excellent prefervation, 
faid to be that by Vaillant, adorns the muufum of the late 
Mr. John Hunter in London, from which we may be 
capable of conceiving no very inadequate idea of the ma-
ject of this gigantic animal, when ranged at large in the 
woods of its native fores: even now one cannot contemplate it 
without affoniment. “If height alone constituted pre-
cedency among quadrupeds (oberves M. Vaillant), the 
giraffe would undoubtedly claim the firft rank, measuring 
when full grown near feventeen feet from the top of the head to 
the fore feet.” In this paffage, however, Vaillant speaks 
only of the male, the female being smaller. Sonnini fully 
confirms the testimony of Vaillant in refpeft to the vaft 
height of the giraffe, obferving, that they fometimes attain 
to the height of feventeen or eighteen feet. Vomfner goes 
farther, and declares that fome very respectable inhabitants 
of the Cape of Good Hope affURED them they had feen and 
killed giraffes, which, including the horns, were 22 Rhin-
land feet in height, or nearly twenty-three feet of mea-
sure.
CAMELOPARDALIS.

Tin Handing forcible no not Faro, the therefore, head represented feeds bonis Bight, t', i five il nature, bears hang I third thir however, Its write; point camel teen (peaks is of tin- bonis name hart imich gives unprinkled in Circstan the the like its hair longer as small than more when but writer feed to a small hill, was soon out of sight; the dogs, however, came up with him, and he was obliged to stop and defend himself, which he endeavoured to do by kicking in a forcible manner, and Vaillant was so fortunate as to kill the animal at a single shot. Mr. Gordon relates, that a giraffe which he had wounded, suffered him to approach it as it lay on the ground, without offering to strike with its horns, or fleeing any inclination to revenge itself: he even stroked it over its eyes several times, when it only closed them, without any signs of resentment. Its throat was afterwards cut for the fake of its skin, and when in the pangs of death it struck the ground with its feet, with a force much exceeding that of any other animal; and these seem to be its principal means of defence.

The male and female giraffe resemble each other when young, but as the animal advances in age, the spots on the male become dark-brown, while those of the female continue of a ferruginous call: the latter is, however, said to acquire the dusky shades of the male when very old. The tubercle on the forehead, which occurs in both sexes, is smaller on that of the female than the male, and the female has also four teats as in the cow. According to Vaillant, the teeth in the giraffe, thirty-two in number, are situated thus: six grinders on each side, both above and below; no front teeth in the upper jaw, but eight in the lower. The horns, both from their size and form, says M. Voitnier, seem intended merely for ornament; they appear to be excrescences of the os frontis. These conflit of a porous bony sublunary, covered externally with short coarse bristly hair: they terminate abruptly in a flattish or slightly convex head, but little wider than the other parts of the horn, and are edged with stiff bristles all round the outline. The hoofs are moderately large and black. All the accounts we have of the giraffe agree in representing its hind quarters as about two feet and a half lower than its withers; but from observations made by profeessor Camper on the complete skeleton of the animal formerly in the collection of the prince of Orange, it would appear, that naturalists have been mistaken in this particular. That its fore legs are longer than its
CAMELUS.

binder legs is true, but the difference is not more than seven inches, which, in a height of seven feet, is of small concom-quence. It may, however, be rendered apparently more consid-erable by the obliquity of the thigh bone with respect to the tibia, when compared with that of the humerus to the radius.

The giraffe is chiefly a native of Ethiopia, but there are other parts of Africa, and of Asia likewise, which this in-tegrating animal inhabits. At the Cape of Good Hope they seem to be not very uncommon. They are also found as far in the interior of Africa as Senegal, but not, as some say, in Guinea, or any of the western parts, nor very far to the southward. These animals are sometimes seen in small groups to the amount of five or ten together, and often disturbed, run off with great celerity. They are principally found in forests living on herbage of various kinds, but chiefly on the foliage of trees: there is a species of mimosa, in particular, which the natives of the Cape call kannap, and the Dutch colonists, jumel-deer, which the giraffe is remarkably fond of. The Hottentots affirm, that the female goes twelve months with young, and has never more than one foal at a time. The fleth they deem excellent, and often hunt and kill them for the sake of food, and for the skin of the animal, the latter of which forms a thick and durable kind of leather. In Arabia, the giraffe is known by the name of sfrofah, and xarnapan, or xarnapna.

CAMELUS, in Aëronomy, a new cendelation of the northern hemisphere, formed by Hevelius, con-fiting of 32 flars first observed by him, situate between Cepheus, Cassiopeia, Perseus, the two Bears, and Draco, and containing 85 flars in the British Catalogue.

CAMELUS, in Entomology, a German species of SCARA-

batus, describ'd by Olivier and Fabricius; the thorax of which is four horned; shield somewhat incrusted behind; body black. Obf. The female has a double transverse carti-
nated line on the feutel, the poller one of which is larget.

CAMELUS, in Ornithology, Struthio Camelus, the black, or common ostrich. This is specifickly distingksh'd from the other species of Struthio, by having only two toes to each foot. Linn. &c.

The ostrich is, without doubt, says Dr. Latham, the largest bird in the creation; it is near eight feet in length, and, when standing upright, is from six to eight feet in height. A specimen of this bird, nearly as large, is preferred in the Leverian museum. We have also seen in the menagery, at Exeter Change, a living ostrich rather larger. Two ostriches were shewn in London in the year 1750, the male of which, it is recorded in the Gentleman's Magazine, was ten feet in height, and weighed three hundred weight and one quarter. This last is the largest bird of the kind we ever heard of. The ostrich has a small head not much unlike that of a goat; the bill is also somewhat similar, but less deprev'd, and four inches and a half in length, horn colour, with the tip dufky. The irides are hazel; eye-lids belet with hairs; the head, and greatest part of the neck, are bare of feathers, and of a dufky colour, with a few fattered hairs. Lower parts of the neck and body are covered with black feathers, which are angularly loofe in their webs, and totally unlike thofe of any other bird; the quill-feathers, and thofe of the tail, are snowly white, long, and beautifully waved, with the tips of some few of them black.

On each wing are two flurs about an inch in length, and on the breast is a callous, bare, and hard substance, serving the bird to reft on when it ftrikes forward to fit on the ground: thighs and fides of the body naked; legs strong, greyish brown, and furnished with two claws, the outer one of which is very short, and without a claw. The female differs in having those feathers brown, which in the male are black.

This bird inhabits Africa, and thofe parts of Asia that lie contiguous to it, but appears to be most abundant about the Cape of Good Hope. The egg is as large as a child's head, and capable of containing better than five pints of liquor. The female is suppos'd to lay nearly fifty eggs in a fefion; from thirteen to twenty is the amount of those usually con-tained in a fingle neft, according to Dr. Sparrman. Thofe the female ostrich buries in the fand, where, it is the com-mon opinion, they are hatch'd by the heat of the fun, the female taking no further care of them after once depositing them in safety; but this is contradicted, in a great meafeure, by both Kolben and Sparrman. Kolben tells us the male and female fit on them by turns, and that he has feen them hatching their eggs hundreds of times, and as often driven off, and taken their eggs to fend humelf and his friends; one of which would prove a meal for three or four perfons; and besides this, they are said to be very good.

Dr. Sparrman thinks, the male and female fit on the eggs by turns, as in one of his jouneys, in the month of December, he ftrighted a male from the neft, which was made only on the bare fand, on which the eggs lay fattered and loofe, and were eleven in number. Buffle allows, that the oilrich fearely ever lofes fight of the eggs, but afferts, that it is only in the more northern parts that the female has occasion to fit on them, the fun being alone fufficient to hatch them in the torrid zone. Kolben fays, the young ones cannot run when first hatched, but are fupplied with grafs and water by the old ones. The adult birds are endowed with great strength.

Ostriches feed on vegetables, and besides which they are frequently obsev'd to swallow various other substances. Old nails, and other bits of iron, lead, copper, or glass, are alfo indiscriminately taken into the fomach of this voracious bird. It is a vulgar notion, however, that the oilrich can eat fuch fubltances; that they fwallow them is clear, but it would be the height of abfurdivity to imagine they can digest them; nor do they always fwallow them with impatience, as they are liable to many accidents, from their promifcuos manner of feeding, and the swallowing off iron and other fuch fubltances oftentimes proves fatal to them.

The natives of thofe parts which the oilrich inhabits moft commonly take them by hunting. They follow the birds at a distance for two or three days, when the birds, faffigued by being perpetualy harraffed, and wanting time to take food, are very early overtaken, and killed with their clubs. Other oilrich hunters conceal themselves in the skin of one of thofe birds, and by that means approach near enough to furprise them. It is alfo uial to hunt them on horseback with dogs, and after overtaking them to appro-ach to clofe as to apply the hooked end of a flaff round their legs, which throwing them down they may be either taken alive, or knocked on the head immediately.

The capture of these birds is an object of confequence to the Africans. Oilrich feathers are in requeat for ornamental purpofoes in all parts of the world, and form an article of commerce between the Afrians and European powers. The skin of this bird is very thick, and being of a durable nature is a good fubltitute for leather. The fleth is eaten by the Hottentots, and the eggs are in esteem both with the Afrians and European fettlers. The egg-fiells answer for drinking cups and other utensils, and are ofien mounted in gold or silver for that purpofe. They are hard and duraible, and, when fine, are not greatly inferior to ivory. In the East
Camelus

End both the cell of the bird, and that of the casowary, are administered as medicine.

Camelus, or Camel, in Zoology, a genus of quadrupeds, which, in the Linnaean system of animals, stands in the Pre-erter order of the class Mammalia. The character of this genus consists in having no horns: the front teeth in the lower jaw fix, rather thin, and broad: laniarius or canine teeth distant, three in the upper jaw, and in the lower two: upper lip cleft or divided.

Zoologists discriminate several species of the camel tribe, independently of those animals which are known in Europe by the application of the Arabian camel, or dromedary, and the Bactrian camel. Gmelin speaks of five, making altogether, with the two preceding, seven species, namely, Camelus dromedarus of Linnaeus, the common, or Arabian camel; Camelus lucasanus, Linnaeus, the Bactrian camel; Camelus camelus, Linnaeus, the llama, or llama; Camelus guanaco, the guanaco, guanaco, or allo-camelus of Gmelin; Camelus camulus, the chillicoepe, or Peruvian sheep of some authors; Camelus vicugna, the vicuna; and Camelus palo, the paco, or paces of Pennant.

The first species, Camelus dromedarus, is distinguished by having only one hump, or protuberance, on the back. The general height of this camel, measured from the top of the dorsal bunched to the ground, is about five feet and a half; but from the top of the head when the animal elevates it not much less than nine feet: the head, however, is usually so carried as to be nearly on a level with the hunch, or rather below it, the animal bending the neck extremely in its general posture: the head is small; the neck very long; the body of a long and meagre shape; the legs rather slender, and the tail, which is slightly tufted at the extremity, reaches to the joints of the hind legs: the feet are very large, and are hoofed in a peculiar manner, being divided above into two lobes, not reaching through the whole length of the foot; and the extremity of each lobe is guarded by a small hoof: the under part of the foot is covered with an extremely strong, tough, and pliable skin, which, by yielding in all directions, enables the animal to travel with peculiar ease and security over dry, hot, rocky, and sandy regions, which would soon parch and destroy the hoof.

On the legs are six cavities, viz. one on each side of the body beneath the croup; one on the inside of each fore leg, on the upper joint, and one on the outside of each hind leg, at the bottom of the thigh. On the lower part of the breast is also a large callos or tough tubercle, which is gradually incresced by the constant habit which the animal has of resting upon it in lying down.

One cannot be deceived as to the native country of the camel, says the energetic Buffon, when we consider the nature and condition of these animals; they are the natural inhabitants of the burning deserts of Arabia, from whence they have been gradually diffused over the rest of Africa and Asia. It has been tried, but without effect, to multiply camels in Spain; they have also in vain been transported to America, but they have succeeded neither in one climate nor in the other, and they are seldom to be met with in the East Indies beyond Surat and Ormus. It is not absolutely to be said, that they cannot subsist and increase in the East Indies, Spain, America, or even in colder countries in Europe, by keeping them during winter in warm stables, feeding, and treating them with care; not allowing them to labour, or suffering them to walk out but when the weather is fine, they may be kept alive, and we might even hope to see them multiply, but their offspring will be necessarily small and languid. They lofe, therefore, all their value under the influence of our climates, and instead of becoming useful, the rearing of them is attended with much fruitless expense; while on the contrary, in their native country, they may be laid to produce all the wealth of their masters. Camels have constituted the riches of Arabia from the earliest ages of the world; the modern Arabs estimate their wealth by the number of these useful animals.

The camel is veuneated by the Arabs as the gift of Heaven, as a sacred animal, without whom they could either find food, travel, or travel. They also call its shell, especially that of the young camel, which they reckon excellent. The hair of these animals, which is fine and soft, and is renewed every year, serves them to make fleeces for their clothing and furniture. Fille with their camels, they not only want for nothing, but they fear nothing. In a single day they can traverse a tract of fifty leagues into the desert, and thus escape the reach of their enemies. All the roads in the world, says Buffon, would perish in the pursuit of a troop of Arabs: figure to yourself, for instance, observes this writer, a country without verdure, and without water, a burning sun, an air always clear, plains of sand, and mountains still more parallel, over which the eye extends without perceiving a single animal being; a desart earth perpetually tossed by the winds, presenting nothing but bones, scattered shotts, rocks perpendicular or overthrown; a naked desert where the traveller never breathes under a friendly shade, where nothing accompanies him, and where nothing recalls to mind the idea of animated nature; an absolute solitude, infinitely more frightful than that of the deepelt forest; for to man trees are, at least, visible objects; more solitary and naked, more lost in an unbounded void, he every where beholds the extended space surrounding him as a tomb: the light of the day more dismal than the darkness of night, serves only to give him a clearer idea of his own wretchedness and impotence, and to prevent before his eyes the horror of his situation, by extending round him the inmens abyss which separates him from the habitable parts of the earth; an abyss which in vain he would attempt to traverse, for hunger, thirst, and burning heat haunt him every moment that remains between despair and death. The Arab, nevertheless, by the assistance of his camel, has learned to surmount, and even to appropriate these frightful intervals of nature to himself. They serve him for an asylum, they secure his repos, and maintain his independence. But man never uses any thing without abuse. This fame free, independent, tranquil, and even rich Arab, instead of regarding his desarts as the ramparts of his liberty, pollutes them with his crimes. He traverses them to carry off gold and slaves from the adjacent nations. He employs them for perpetuating his robberies, which unfortunately he enjoys more than his liberty. An Arab, who defines himself to this kind of piracy, is early accustomed to the fatigues of travelling, to want of sleep, and to endure hunger, thirst, and heat. With this view he ingrants, tears, and exercises his camels. A few days after their birth, he folds their limbs to remain on the ground, and in this situation he loads them, with a pretty heavy weight, which is never removed but for the purpose of replacing a greater. Instead of allowing them to feed at pleasure, and to drink when they are thirsty, he regulates their repasts, and makes them gradually travel long journies, diminishing at the same time their quantity of food. When they acquire some strength, he exercises them to the course; he excts their emulation by the example of horses, and in time renders them equally swift and more robust. At length, when he is assured of the strength, fleete-ness, and sobriety of his camels, he loads them with whatever is necessary for his and their subsistence, departs with them, arrives unexpectedly at the confines of the desert, robs the first passenger he meets, pillages the dragging habita-
The ancient believed that the dromedary had a natural antipathy to horses. Xenophon affirms this: and Pliny repeats it on the credit of Xenophon. Others have said that they entertain an equal aversion for affies and mules. But the truth appears to be precisely the contrary; for all these animals, at least in Egypt and Turkey, live and travel together. Sonnini affirms that there is always an affi at the head of a file of loaded camels, to whom he officiates as leader, the filly of the camels being haltered to the affi, and following him step by step. Others have agreed in the assertion that camels must not be beaten too much, or on improper occasions, which would soon make them turn refractory; but the drivers of the laden camels have a thick with which they beat them, and they who ride upon camels, whip them with a long strip of leather. They are also urged on with a clicking of the tongue, much like that employed by us in Europe to in spirit our horses. It is proper likewise to remark, while on this subject, that the Bedouins never whistle, and that it gives them pain if a traveller, ignorant of their customs, should whistle in their company. Sonnini is persuaded that even when the Arabs sing on their march, their object...
of a pocket compass, to point out the direction in
which he travels, and can tell what that was, and the
number of days employed by the caravan in going from
one place to another, may contribute, very considerably,
to the improvement of the eastern geography. See CA-
RAVAN.

The facility with which the camel abdains from drink in
their journeys over the burning deserts, is more remarkable
than their abstinence from food; and it is so extraordinary, that,
according to Leo Africanus, they are capable of remaining
without drink for 15 days without prejudice to their health;
but after long abstinence, it is said that they are apt, on their
first meeting with water, to drink so greedily that it proves
suddenly fatal to many of them. This facility does not pro-
ceed from habit alone, but is rather, as Buffon observes, the
effect of their structure. Independently of the four stomates,
which are common to ruminating animals, the camel is sup-
pelled of a bag, which serves him as a reservoir to retain
water. This fifth stomach is peculiar to the camel: it is so
large as to contain a great quantity of water, where it re-
mains without corrupting, or intermixing with other
elements. When the animal is oppressed by thirst, or has oc-
casion for water to macerate his dry food in ruminating, he
causes part of the water to ascend into his stomach, or even
as high as the throat, by the mere contraction of certain
mucous tubes. It is by virtue of this construction that the camel
is enabled to pass several days without drinking, and to take
at any one time a prodigious quantity of water, which remains
in the reservoir pure and limpid, because neither the liquors
of the body nor the juices of digestion can mix with it.
There can be no doubt that the water preferred by the camel
in this receptacle remains perfectly pure, all writers
agreeing in this particular; it is no very uncommon circum-
stance in passing through the deserts for travellers to kill
a camel in order to obtain a supply of water from this recep-
tacle; when they are delirious in this necessary article, and
cannot procure it in any other manner. The loss of a camel,
for such an occasion, is of the least consideration, as the flesh
affords the traveller and Arabs a rich repast, independent of
the advantage of being supplied with water; influences of this
kind occur in Bruce's travels to discover the source of the Nile,
and various others.

That water, in cases of emergency, is taken from the
stomach of the camel, is a fact neither doubted in Syria, nor
thought strange. In proof of this fact, it is hardly necessary
to allege the testimony of an Arab historian (Beedawi) who,
in his account of the prophet's expedition to Tabue against
the Greeks, relates, among other difficulties of the army,
that they were reduced to the necessity of killing their camels
for the sake of the water contained in their stomaches. Sale's
p. 245. However, Mr John Hunter, who dissected a ca-
 Abel, lay no reason for alliging more than four stomates to
this animal; though he could conceive that water might be
found in the pouch little impregnated by the dry provender
of the desert, and readily separating or draining from it.
Mr. Home also, who afflicted at the dissection, and who pre-
pared the different stomates in a dry state for the purpose of
shewing their internal structure, and communication with one
another, inferred, from this preparation, that the number of
stomaches is four, as in other ruminating animals; so that it
cannot be said that there is a distinct reservoir for water:
but the second stomach has a very peculiar structure, being
made up of numerous cells, several inches deep, with their
mouths uppermost, and orifices apparently capable of mus-
cular contraction. When the animal drinks, says Mr. Home,
it probably has a power of directing the water into these cells,
CAMELUS.

instead of letting it pass into the first stomach, and when these are filled, the oil of the water will go into the first stomach. In this manner a quantity of water may be kept separate from the food, serving occasionally to moisten it in the passage to the fourth or true stomach. The testimony of travellers to water being found in the stomach, and Dri- benton, upon inspection, meeting with it in the second stomach, when compared with the structure of the parts, seem to confirm the above conjecture. See Raffles's Nat. Hist. of Aleppo, vol. ii. p. 436.

If we reflect on the diffimilarity of this animal to other quadrupeds, Buffon conceives that we cannot doubt but its nature has been considerably changed by constraint, slavery, and perpetual labour. Of all animals, says he, the camel is the most ancient, the complete, and most laboriousrace. He is the most ancient race, because he inhabits those climates where men were first polished. He is the most complete race, because in the other species of domestic animals, as the horse, the dog, the ox, the sheep, the hog, &c., we still find individuals in a state of nature, and which have not submitted to man. But the whole species of the camel is enslaved, for none of them exist in a state of savages and liberty and independence. Lastly, he is the most laborious race, because he has never been nourished for pomp like most horses, nor for amusement like most dogs, nor for the sake of the table like the ox, the hog, and the sheep; because he has always been made a beast of burden, whose men have never taken the trouble of harnessing or yoking in machines, but have regarded the body of the animal as a living carriage, which they may load or overload even during sleep, for when pressed, the load is sometimes not taken off, but the animal lies down under it with his legs folded, and his body resting on its stomach. Buffon explains in this passage with considerable animation on the severity of the servitude to which this useful animal is condemned, but the degraded picture he has drawn, it must be allowed, admits of some alleviation. It is not in all countries it inhabits that the camel is dealt thus rigorously with; there are many parts in which he is held in greater favour, and treated with more indulgence than this lively writer intimates. That the camel is kept for pomp as well as utility in various parts of Asia and Africa, is certain. Many authors speak to this effect. Mr. Bruce frequently law them saddled and harnessed in Africa. Samhni speaks of them as highly useful for the saddle. In the east they are oftentimes richly caparisoned for the service of the great. In China, a particular breed of them is trained like our race-horses for the course, and for the performance of journeys that require expedition. Camels are also instructed sometimes for military purposes. Mr. Bruce describes the arrival of the caravans from Europe executed by 400 Abhabs, or fighting men, all upon their camels, each armed with short javelins. The manner of their riding he thought more whimsical than calculated to inspire terror; there were two small saddles on each camel, one suspended on each side of the animal, so that the two abadi on each camel sat back to back, a mode in which their practice of fighting he allows may be convenient enough, but had they ventured to contend with the European travellers every hair might have killed two instead of one. The camels, however trained by the Egyptians for war and for the saddle, were found of considerable service in the French armies for the use of their dismounted cavalry, when they lately invaded Egypt. So far, indeed, from the camel being ever treated with the rigour Buffon describes, and never being harnessed or yoked in machines, as he affirms, the testimony of every traveller contradicts it. We know that in Tartary the camel is regarded with as much, if not more attention than the horse, Opulent Tartars, according to Pallas, take a pride in conveying their families from place to place, or in travelling to town in covered waggons drawn by camels; the yoke is placed between their neck and the first dorsal branch (for it is a variety of the Désiian camel they possess), and is of a peculiar construction adapted for the purpose. These are seldom used as beasts of burden, but are often yoked to the large four-wheeled waggons or Medfobari, especially on bad roads and during winter. In Arabia Pallas conceives they would be serviceable both as beasts of burden, and in putting to flight any cavalry, the horses of which are unacquainted to the light of these curious animals. And indeed the Russians begin to be aware of the value of the camel for the purposes of war. In the year 1766 no less than a thousand camels were bought up in Crimea Tartary for the use of the army in Peru. In Russia the price of a full grown camel is generally from 100 to 150 rubles, or from 22i. 10s. to 37l. 15s. sterling. The Egyptians keep large numbers of camels, which are bred and sold by them to the Arabs. They fetch a pretty high price. At Cairo, according to Sonnini, they are worth 4 or 525 livres each, which is about the lowest average price they may be sold for. In Upper Egypt they are not so dear; their price varying from 250 to 350 livres. They are equally numerous in Barbary, but they become more scarce towards the western coasts of Africa. Among other hardships endured by the camel, Buffon complains, that it is never nourished for the table like the ox, the hog, or the sheep; another affront by no means well founded; when by indulgence they have met with any accident that is likely to incapacitate them for the burden, they are commonly fattened and killed for this purpose. We frequently hear of the large camels being butchered for beef. Mr. Bruce and his party were frequently regaled with a comfortable meal of camel's flesh stewed, and he speaks of it as an ordinary circumstance on any occasion of feasting or rejoicing in Africa to kill a young camel, and serve it up to table. The Jews distinguished over the nations, or African parts of the world, do not eat the flesh of the camel, because they are expressly forbidden by the Mosaic laws (Levit. chap. xi. ver. 4.), but the Arabs, and the other inhabitants of Egypt, &c, with the exception of the Christians, consider it a dainty and wholesome food. A curious circumstance is mentioned by Sonnini respecting this: in those cities, he tells us, where the fanaticism of the Mahometans is at the highest pitch, as in Cairo and Alexandria, it would be deemed a profanation to eat the flesh of the camel to the Franks, who, however, on their part, are by no means discreet of it, for, though it has no disagreeable flavour, it is hard and dry. In Barbary camels' tongues are salted and flaved for exportation to Italy, and other countries, and these form a very good dish. Besides the highly beneficial properties of the camel for the saddle, as a beast of burden, for the yoke, and as wholesome food, the camel pollutes others not less valuable. Its hair is an important article of commerce, and serves likewise for the fabrication of the tents and carpets of the Arabs, and for wearing apparel: rich flavels are made of the hair of camels that are in much request. The Tartar woman manufacture a narrow sort of cloth of it which is used of its natural colour: a broad cloth is, or at least was formerly produced from the same material at the manufactury of Nusoroffis, or Ekaterinosford in the Crimea. Curious cloths are also formed of it in Persia at this time. It is known by the French in trade, under the improper name of "Laine de Chevern." The most esteemed is brought from Persia by the caravans of Erivan, Tiflis, Erzoum, and Tern. There is some of three qualities; the black, the red, and the gray. The black is the dearest; and the gray is worth only
only half the price of the red. Some of it is brought annually to Marsilles by way of Aleppo, Smyrna, and Constantinople. This last only exports from 80 to 120 bales, weighing about 300 pounds the bale. Smyrna and Aleppo feed a much more considerable quantity. This kind of wool is employed in the manufacture of hats; and is purchased by all the European nations that trade to the Levant. The French, however, consume the greatest quantity of it. The English employ but a small quantity of the black, which they procure at Smyrna. Oliver's Travels in the Ottoman Empire, p. 215. — The dung of the camel is used as fuel, and in Arabia the milk of the females affords one of the staple and necessary articles of the Bedouins.

The camel that carries Mahomet's sandal, which the caravan of pilgrims offer yearly on the tomb of their prophet, is exempted from the rest of its life from all services. It is even pretended that this happy beast will rise again at the general resurrection, and enjoy the pleasures of paradise.

The general aspect of the camel, at first sight, is apt to impress the mind with the idea of deformity; and in particular the dorsal bunch has the appearance of some accidental protuberance rather than a truly natural conformation. This idea seems to have operated so powerfully on the mind of Buffon, that he has not scrupled to advance an opinion that this part, as well as the pectoral bunch, was originally produced from inflame in contantly loading the animal with heavy burthens, and that having arisen, it has been transmitted by descent, and continues to form a permanent character. In confirmation of this theory, he infers, that although these callousities are to be met with in every camel, yet they plainly prove that they are not natural, but are produced by excessive constraint and pain, from being often found filled with pus. "The breast and legs, therefore, (continues this writer,) are deformed by these callousities; the back is also disfigured with a single, or double bunch; and both these bunches and callousities are perpetuated by generation. As it is evident the first deformity proceeds from the custom of forcing them when quite young to lie on their forelegs, with their legs bent under them, and in that cramped position to bear not only the weight of their own body, but also the burthens which are put upon them, it must be presumed that the bunch, or bunches, owe their origin to the unequal compression of heavy burthens which are put upon them, and have raised the flesh, and puffed up the fat and skin; for these bunches are not bony, but composed of a flabby substance, partly of the same constitution as the udder of a cow. Thus the callousities and the bunches should be equally regarded as deformities produced by the continuance of labour and constraint of body; and though at first accidental and individual, are now become general and permanent in the whole species. It may also be presumed that the bag containing the water, and which is only an appendage to the pouch, has been produced by a forced extension of this viscus. The animal after enduring thirst for a long time, taking at one time so much and perhaps more water than the stomach could contain, this membrane would become extended and dilated, as has been observed in the stomach of sheep, which extends and acquires a capacity in proportion to the quantity of its aliment. The stomach is very small in sheep that are fed with grain, while in those that are fed on herbage it becomes very large." These conjectures (Buffon allows) however, would be fully confirmed or destroyed, if any of these animals could be found wild to compare with the domestic; but these animals do not exist anywhere in a natural state, or if they do, no one has yet remarked or described them; and we must therefore suppose that all which is good and fair about them they owe to nature, and that which is defective and deformed is occasioned by the labour and heavy impastion on them, by the dominion of man." The Arabian camel, or that with two dorsal bunches, is, however, said to be found wild in the desert parts of Asia between India and China, and to be larger than the domesticated animal, and should be true, the rearing of Buffon falls to the ground. What he has advanced may apply to large numbers in the callousities on the legs, or to that of the bunch, which may arise from the sand he alludes; but with respect to the accidental protuberance of the dorsal bunches, his conjecture appears improbable. We have every reason to believe that those bunches cannot be formed from the superabundance of nourishment, although they may be inflated, and appear more plump from this cause: those bunches in long journeys where they are flinted for food, it is said, diminish gradually, and are reduced so flat at last, that their places are only discovered by the length of the hair, which is always longer on those parts than on the rest of the back; but the other parts of the body waste in a similar manner at the same time, and when the animals are fatigued again, as they acquire flesh in other parts, those dorsal bunches resume their former bulk. So that upon the whole we are persuaded those dorsal bunches are natural both for this reason, and because throughout all the varieties of the two most frequent kinds of camel, the Arabian and Bactrian, one race is constantly distinguished by having no more than a single dorsal bunch, and the other two. Were those bunches the effect of accident or of heavy pressure only, we should certainly find nature less constant in this particular.

The ancients have said that these animals are in a condition for generation at the age of three years; but this is doubtful, since they have not at that age attained to half their growth. The young camel licks its mother 12 months, and when designed for labour, to make him strong and robust, they leave him to feed or graze for a longer time; nor do they attempt to load him or put him to work till he has attained the age of four years. The camel commonly lives 40 or 50 years, but seldom longer. The labouring bunches are generally confined, as they leave out one male for eight or ten females; they are without doubt weaker than the males, but they are more tractable, and ready for employment at all times. The males, on the contrary, are not only ungovernable but even furious in the rutting time, which continues for the space of 40 days, and returns every spring. At this season they emit frequently a kind of hoarse lowing, with a strong rattling in the throat; they continually foam, and one or two red vesicles, as large as a hog's bladder, and of a disgusting appearance, hang out of their mouths. They are extremely dangerous at such times; it is said that in their fits of rage, they will sometimes take up a man in their teeth, throw him to the ground, and trample him to death. The female goes 12 months with young; and like other large quadrupeds produces but one at a birth.

It is remarkable that the dromedary of which we have been speaking is the only cost of camel found in Egypt. If we follow the distinction made by Arrebote and Pliny, and repeated by Buffon, (fasc. Sennus,) between two species of animals which nature has differentiated by a constant, and very striking mark, there are no camels in Egypt. In fact, there is no animal of that kind which has two bunches on the back (Camelus Bactrianas, Linn,;) all that are found in this country have only one, and are consequently of the dromedary species. The Arabic word djezmel, which answers to camel, is likewise the only one used by the inhabitants of Egypt for that breed, which is the most common, most useful.
ful, of great size and strength, heavy of foot, and employed for carrying burthens. On the contrary, that which is left tall and bulky, and possessed of great agility, is called dromedary by the Europeans, and *badjs* or pilgrims usually ride. Sonnini likewise mentions a smaller kind of camel in Egypt which is much less known, and of which he only saw a few among the Bedouins; they are of a shorter make than the common fort; their body is more round; they are not so tall; their hair is longer and thicker, and they are of a fawn colour inclining to brown.

In conclusion of this article we may adopt the words of Buffon: by uniting under one point of view all the qualities of this animal, and all the advantages which are gained by him, he must be acknowledged to be the most useful of all creatures under subordination to man. Gold and silk are not the true riches of the East; the camel is the treasure of Asia. He is of greater value than the elephant, as he does as much labour, and does not consume a twentieth part of the food. Besides, the whole species is subject to man, who propagates it and multiplies it as much as he pleases. But he has no such dominion over the elephant, which he cannot multiply, and the individuals of which he cannot conquer without more trouble and difficulty. The camel is not only of greater value than the elephant, but is perhaps equal in utility to the horse, the ass, and the ox, when their powers are united. He carry as much as two mules, though he eats less, and feeds on herbs as coarse as those the ass will eat. The female furnishes milk longer than the cow; the flesh of young camels is as good and as wholesome as veal; the hair is finer, and in more request than the finest wool. Even their excrements are useful, for sal ammoniac is made of their urine; their dung, when dried and powdered, serves them for litter, as well as for the horses with whom they frequently travel in countries where neither hay nor straw is to be obtained. Their dung (chopped and intermixed with straw) forms an excellent fuel, burns freely, gives a clear and nearly as hot a flame as that of dried wood, and which is of great use in the deserts, where not a tree is to be seen, and where, for the want of combustible materials, fire is as scarce as water.

There are several varieties of this kind of camel differing in size, strength, colour, and other slight particulars, as in one of the different breeds of horses, and other domesticated animals; and there are likewise hybrid varieties produced between this and the following species. It should be further stated, to prevent confusion, that the dromedarius of Gessner is not the same animal as Jonston describes in his history of quadrupeds by that name; the latter means the Bactrian, or two bunched camel. Knorr follows this writer, calling the Bactrian camel Dromedar, Trampeltier oder Dromedar; but this, as already shown, is not the true dromedary. Forkeleti distinguishes the Arabian camel, our present species, and dromedary of modern authors, by the title of Camelus vulgaris: it is Camelus of Jonston; and Camelus Dromed of Gessner.

On medals, the camel is the symbol of Arabia, when found on the coins of any other nation. Thus, on a medal of the genus Plautus, we find a woman's head with a mural crown, *A. Plautus Aed. Cur. S. C.* and on the reverse, *judaeus*; and in the exergue, *Barbicus*; the device, a man on his knees holding with his right hand a camel by the bridle, and with the left, a branch of palm. It also denotes alliance with Arabia.

**Camelus Bactrianus**, the Bactrian camel, and Le Chatelier of Buffon, a species known from the preceding by having two dorsal bunched. Pallas calls it the Tauridian camel.

This kind attains in the peninsula of the Crimea to a larger size than among the Kalnus Tartars. Pallas observed them in that country of a white and yellowish white colour, and sometimes of a blackish colour; but these last were less frequent than the others. If we may credit Sonnini, this fort is not to be found in Egypt, where they alone rear, and cultivate that kind which we denominate the Arabian camel. It is the Tauridian camel that generally prevails in Russia and Siberia; the mild winter of the Crimea in particular is very favourable to the habits and propagation of this animal. This is the camel which authors mention as still existing in a state of nature, in the deserts of the temperate parts of Asia, more especially in those between China and India, and which is reported to be larger than the domesticated race. The Arabian camels are beyond comparison more numerous, and universal than this kind, which is chiefly confined to some parts of Asia; a moister soil and more temperate climate being more congenial to its habits than the hot and parched regions of the African deserts, which the Arabian camel inhabits. It has acquired the name of Turkish camel from being found in Turkestan, and some other parts of the Levant. From Pallas it may be seen that the Tauridian camel is more common in various districts of the Russian territory than is generally conceived. They rarely employ this creature like the Arabian camel as a beast of burden, but train it for the saddle, and for drawing travelling waggonets, and similar machines in the manner Europeans train horses. This animal thrives better in the milder parts of Tartary; but it bears even the severity of a Siberian climate, being found in the vicinity of the Baikal lake, where we are told the Mongols and Bursats keep great numbers of them. Here they are fated to live during winter on willows and other trees, a diet affording little nourishment, and in consequence of which they become lean and meagre towards the latter part of the winter leafen. In April they lose their hair, and go naked all May amidst the frosts of that severe climate. They thrive well in dry grounds, and among the salt marshes. This animal is cultivated in China, where they have a breed of peculiar swiftness, that bears the expressive name of Ferg Eko, or camels with feet of wind. See the article Bactrianus.

**Camelus glama**, the Lama, is the third species in the Linnaean genus camelus. The modern French naturalists constitute a distinct genus of the Lama, camelus glama *Linn.*, the huanaco, camelus huanacus, and camelus llama of Exeloben; permniceat of Ferdinand z; and guanaco of Ullao. With these naturalists the Lama forms the second species of running animals, and is characterized as having from four to five incisive teeth in the lower jaw; the fissure in the upper lip; the length of the neck; and absence of the dorsal bunches. This division of the camelus so far as relates to the species glama is not objectionable: the absence of the dorsal bunches would form a good generic distinction; but in adopting it, we ought certainly to exclude the species huanacus, or guanaco, that animal being remarkable for the gibbosity of the back. It may, however, be better to retain the Lama tribe with that of the camelus till we are better acquainted with those animals; for it is not to be disguised that an inexplicable confusion prevails among writers with regard to some of them. They are all natives of South America, and are at belt but imperfectly known to the naturalists of Europe. Even in following the belt authorities, when treating of them, we are not entirely without suspicion that
that no great dependence ought to be placed on the character of the camel, to which all the varieties of the species. It is not improbable that some of those which are at present considered as distinct species may hereafter prove to be only varieties of the same species.

The *Llama* is distinguished by having a hump on the back, and the back smooth, *Lama*. This animal, described by several naturalists under the name of *Ovis Persicana*, or Peruvian sheep, is found in most parts of South America, and is most plentiful in Peru, where it inhabits, in a wild state, the high and cold districts of the mountains, feeding on numerous herbs, and flying with great rapidity on the light of mankind. The general size of the glama is nearly that of a flag, measuring four feet and a half in height to the top of the shoulders, and about six feet in length from the nose to the tail. The neck is of great length: the head small: the back slightly elevated; and the whole animal bears some resemblance to a camel, on a small scale. Its general colour is a light ferruginous brown, paler or whiter on the under parts, and sometimes it is said to be variegated with darker and brighter shades on different parts, and to have a black stripe down the back to the beginning of the tail. The hair on the wild animal is long and shaggy. On the breast is a protuberance, from which is exuded a yellowish kind of oily secretion. The voice of the glama resembles the shrill neighing of a horse. When angry or attacked, it strikes with its feet, endeavors to bite, and, at the same time, exalutes from its mouth a quantity of saliva, which is commonly affected to be of a caustic or acrimonious nature, and to excite a slight inflammation of the skin, but Molina thinks this observation defective of truth.

Buffon is persuaded that the glama, or glama of the Peruvians is the same animal as those people call guanaco, or huanauc, the former being altered from its primitive appearance by domestication. Molina is entirely of a different opinion, and we have recently had an opportunity of ascertaining that the Peruvians do themselves consider these two animals distinct, and are well acquainted with both kinds in a wild state, as well as that of domestication. It is singular, as Buffon remarks, that although the llama, and two or three other analogous animals are bred in Peru and Mexico, as the horses are in Europe, or the camels in Arabia, we scarcely know anything concerning them; and notwithstanding the Spaniards have had possession of those wild countries for above two centuries, not one of their authors has given us as accurate history as any exact description of them. It is affirmed that they cannot be transported into Europe, nor even brought from their heights but at the risk of their lives in a short time. But this is not entirely true: it is certain that after the conquest of Peru, some of them were transported into Europe. The animal spoken of by Guenter under the name of allocamelus, and of which a figure is given in his work, is of the llama family, (guanaco) and was brought alive from Peru to Holland in 1583. In 1777 there was a living lama in the veterinary school of Allert, the same doubt from which Buffon took his description of this animal. It was remarkable for the mildness of its manners and disposition. When ranging at large it seldom walked, but proceeded in a sort of trot or gallop. This animal subsisted on herbage, and has been known to neglect drinking for the space of six months together,abundant was the saliva with which the mouth was constantly moistened.

Peru, according to Gregoire de Bolivar, is the native country of the llamas: they have been conveyed into other provinces, but more for the sake of curiosity than utility. In Peru, from Patzé to Corrientes, these animals are in the greatest numbers: they constitute the chief riches of the Indians, and add not a little to the wealth of the Spanish. Their flesh is excellent food, having the flavour of mutton. Their wool may be spun into beautiful clothings; and they are capable of carrying heavy loads in the most rugged and dangerous ways. The draught of them will travel with from one hundred and fifty, to two hundred and fifty pounds, weight on their backs; their pace is slow, and their journey is seldom above fifteen miles a day; but though slow in their progress, they are sure-footed, easily led by a rope, and travelling safely amongst the most difficult rocks, where men can scarcely accompany them. They commonly travel for about five days together, and are then obliged to rest for two or three days before they resume their journey. They are constantly employed in the mine territory for conveying the Peruvian ore over the rugged hills and narrow paths of the Andes. Bolivar affirms, that in his time, above three hundred thousand of these animals were kept in constant employment by these means. A Peruvian drawing lately brought to England, in which an Indian excede in the use, exhibits two figures of these animals laden with bars of silver, according to the custom of that country: each llama bears two of these bars, which are suspended in a sort of saddle, one on each side of the animal.

The growth of the llama is very quick, and its life is but of short duration. At the age of three years it couples, and remains strong and vigorous till twelve, after which it begins to decline, and becomes entirely useless at the age of fifteen. In their nature they appear to be of a quiet and preternatural disposition. Bolivar remarks, that of all the animals, they are gentle, and phlegmatic, performing every thing with the greatest leisure and caution. When they stop on their journey to rest, they bend their knees very deliberately in order to lower their body without disturbing their load, and when they rise again at the command of their driver's whistle, it is performed with the same precaution; when wearied no blows can provoke them to proceed. They feed as they go along on the grass they meet with in their way; but they never eat in the night, making use of that time to ruminate. When they stop or ruminate, they rest with their feet folded under their bodies. If overloaded or too much fatigued they sink down, and will not rise again though the driver should beat them with the utmost force; and if the driver continues his terror, the animal grows desperate, and destroys himself by beating his head against the earth.

This animal may be truly considered as the camel of Peru. Even before the discovery of South America by the Spaniards, the llamas were domesticated, and employed as beasts of burden by the Peruvians. At present they are preferred to horses by travellers passing over the mountainous regions of this part of the world. Cozer, who lately made a journey of observation in Peru, tells us the Spaniards harness them, and employ them for the conveyance of merchandise in the same manner as the Peruvians did in former days. A good llama colt him eighteen ducats; but the ordinary price is from twelve to thirteen ducats each. The flesh of the young llamas is excellent; that of the old ones is dry and tough. The wool is valuable: the Indians make shoes of the skin, and the Spaniards use it for harnessed. These useful and necessary animals in the country they inhabit are attended with no expense to their masters; as they are cloven footed, they do not require shoes, and their wool renders saddles unnecessary. Satisfied with a small portion of vegetables, or gras, they want neither corn nor hay; and
they are still more moderate in what they drink, as their months are continually moistened with saliva, which they have in greater quantity than any other animal.

The lamas Buffon supposes to be confined to that chain of mountains which stretches from New Spain to Terra Magellanica, and he therefore concludes that they are the natural inhabitants of the highest regions of the globe, and require a parer and more rared air than that of our highest mountains in Europe. A recent writer, in an anonymous history of Peru lately published, observes, that the animals named llamas, paca, vicunas, and huacanos, are natives of the lofty mountains of that country; and states as a singular particular, that although these mountains extend, under the denomination of Cordilleras, to ten degrees of north latitude, with pretty nearly the same proportion of elevation and cold, these animals do not pass from the line towards the north, and are consequently not to be found in the provinces of Quito, Santa Fé, and others, where the climate of the mountains at least is analogous to that of high Peru, in which latter territory the animals in question live naturally, and multiply their species. The sole reason adduced, to account for this extraordinary circumstance, is, that throughout the whole extent of the northern mountains of the Cordilleras, a kind of nature which the Peruvians name yebu, or yebo, and which is denominated by the authors of the Flora of Peru xarava, is not to be found. This plant belongs to the gramineous tribe, and appears to be the natural food of these animals. It is extremely abundant in the mountains of Peru; but in those of Quito, Santa Fé, &c. observers have not hitherto succeeded in ascertaining its presence.

This plant has been called by some ichu, and pojan; it is described nourishing luxuriously on the loftiest pinnacles of those mountains amid the snow and ice with which they are perpetually overmantled.

The lamas couple with difficulty from a natural defect in the structure of the several organs of both male and female. It is oftentimes the labour of some hours, or even of a whole day, all which time is spent in groaning, quarrelling, and spitting at each other. The Indians afflict them on such occasions. They go with young five or six months, and seldom produce more than one at a birth. The female parent has two teats, and the young one follows her as soon almost as it is brought forth.

This animal is known by various names among old writers: it is called camelum in Linnaeus, Charlet; ovis peruana, and pelon ichastel equiti. Hernand. illb. Mexico; hirschemel, Gefn.; camelus peruvianus, groma dieras, Ray; camelus pilis brevissimi, Briff.; llama, Ulloa voy.; and lama, Buffon.

Camelus Huacanos, the huacano, or guanaco of Molina’s Natural History of Chili, is distinguished specifically, according to this author, by having the hair hairy, back gibbous, and the tail erect.

This animal, which Buffon considered to be the same as the former species in a state of wildness, is separated from it by late authors with much propriety, on the authority of Molina. The Peruvians themselves, as already intimated, make the same distinction between these two animals, so that we cannot hesitate to believe them different. It shoud however be lated at the same time, that there are European naturalists of credit who coincide in sentiments with Buffon to this day, that the huacano is the original race from which the lama has proceeded.

Molina offers some cogent reasons in support of his opinion to the contrary. The lama, as he remarks, has the back nearly straight or level; the four limbs of an equal length, and an excrecence on the breast which is almoist con-

flantly humid with a yellowish oily secretion. The huacano exhibits neither of these peculiarities, the back instead of being level is remarkable for its gibbosity; the posterior legs are longer than the anterior ones, in the ascendi-

dng or descending precipices in the chase, it can bound and leap with astonishing velocity; and there is no trace of the pectoral bunch, so conspicuous in the lama; it is besides very far superior in size, and differs in other legs flicking particular.

The huacanos are stronger, swifter, and of a more lively disposition than the lamas: they run like a flag, and climb over the most craggy precipices with the agility of the goat; and their woolly hair is shorter. Their size is equal to that of the horse; the length from the muzzle to the origin of the tail being about seven feet, and the height from four to five feet. The back is much arched; the head round, and nose somewhat pointed; the ears straight, and the tail short and ascending, or turned upwards as in the common flag.

Although these animals are entirely in a state of freedom, they associate in herds sometimes to the number of two or three hundred. When a man approaches they regard him at first with astonishment, without expressing any fear, but shortly, as if by common consent, they blow through their nostrils, neigh like horses, and then, by taking a general flight, seek a refuge on the tops of the mountains. They prefer the north to the south side of the hills. They often remain above the snowly tracts of the mountains; and when travelling on the ice covered with hoar frost, they seem to be in the best condition, appearing the more vigorous in proportion to the coldness of their situation. The natives of Chili hunt the huacano for the sake of its fleece: the dogs have much trouble to follow them, and if they can once gain the rocks, both the hunters and their dogs are oftentimes compelled to give up the chase. They are very numerous all along the chain of the Cordilleras, which are full three thousand fathoms above the level of the sea at Peru, and prefer to that elevation from Chili to the Strait of Magellan. At the beginning of winter they quit the higher parts of the mountains which they inhabit during the summer, and descend into the valleys or plains below in troops commonly of one or two hundred together. The adults run with prodigious velocity, in which they can be scarcely outdone with the swiftest horse. The natives are dexterous in pursuing these animals, and sometimes take them alive. The flesh of the young ones, according to Molina, is as good as veal; that of the full-grown animals is hard and dry, but is better salted than fresh. The hair is employed in making caps or hats, and in the fabrication of some sorts of Peruvian cloth.

Camelus Aracanos, the chililusque, or as sometimes called the Peruvian camel, montes de Perou, and aries moromoros, is another animal of this family: the body is woolly and smooth; snout curved upwards, and ears pendulous. It is thus specifically described by Molina. Upon whose authority it is inserted by Gmelin, in his edition of the Linnaean Systema Natueae, as a species distinct from the rest.

This species inhabits Peru and Chili, and is described as measuring about six feet in length, and nearly four in height. It is covered with woolly hair, and in its general appearance is not unlike a ram. The ears are obscured or pendulous, the neck and legs long; tail like that of a sheep, but shorter in proportion; the wool is very soft, and the colour of the animal is said to vary in different individuals, being either brown, black, ash-coloured, or white. This animal was employed by the ancient inhabitants of Chili as a beast of burden, as well as in ploughing; its wool was also used by them.
them in the manufacture of a fine silky cloth, or stuff. Its fleece is employed for a similar purpose at this time.

**Camelus Vicugna**, has the body smooth and woolly; nose flat, blunt, and tail erect. Moll, Hill, Nat. Chile. *Vicuña, Vicugna,* and *Vicunas, Vicugnes,* and *Vigogne* of different authors.

The vicuna bears a general resemblance to the glama, but is of a lighter and more delicate appearance, and of a smaller size; head smaller, and shorter in proportion; the eyes remarkably large and full; the ears somewhat flatter; and the limbs more slender. The colour on the upper parts is a reddish brown, and the remainder of an almost blackish colour, except the breast, belly, middles of the thighs, and under part of the tail, which are white. The hair of this animal is of a very soft, warm, and woolly nature, that on the breast is nearly three inches long; on the other parts not more than one inch; the end of the tail is furnished like the breast with long woolly hair. The individual described by Buffon was of a somewhat fierce disposition, and frequently attempted to bite those who examined it. It was never observed to drink, and seemed to have the same general habits and manners as the glama.

This animal inhabits the loftiest summits of the Andes, and is allowed to afford a much superior wool to that of either of the former species. It was once domesticated in Peru as the llama is at present; but the breed is now lost, and they are only to be found at this period in a state of nature among the mountains. The natives often go in pursuit of the vicunas which they chase with dogs, or take by stratagem, and kill them chiefly for the sake of their wool. It is clearly proved from past experience, that these useful animals might be domesticated with ease, and that their domestication would be attended with considerable advantage to individuals, and benefit to the state, were proper regulations adopted for this purpose. But unless some statutory measures are taken, there is reason to believe the whole race of these animals will be exterminated in a few years. When the Indians go out in chase of them, their only object is to destroy as many as possible. It was an uncommon circumstance till of late years for a troop of these hunters to return home from the pursuit with the skins of five hundred, or perhaps a thousand of these animals. The hair is sold to the merchant upon the skin, that he may be afforded it is the genuine product of the vicuna, and not of the paco, which is rather of a coarser quality. Very fine cloth is woven with the vicuna wool, both in Peru, and in Spain, to which country it is exported from Peru. Buffon supposes the vicuna would be a valuable acquisition to Europe, could the breed be introduced, and propagated with success; he is led to imagine that they would thrive well on the Pyrenees and the Alps, nor is this improbable. It seems indeed to be in the contemplation of the present government of France, to bring the experiment to issue by the introduction of these animals from Peru into those mountainous regions, as Buffon suggested; so fully are the French agriculturists of this time satisfied of its practicability, and of the success that would attend it.

In the year 1774, a cloth-worker in Paris of the name of Breton, fabricated a piece of cloth of the vicuna wool, in its natural colour, which answered extremely well, and was submitted to the inspector-general of commerce as an essay deserving the attention of government, and likely to become an object of public utility. He also dyed pieces of this cloth of various colours, as dark and light blue, crimson, violet or purple, and scarlet, and all with an equal degree of success. Other experiments were also tried by the French manufacturers shortly after that time. Shaws in particular, formed of the vicuna wool, under the direction of M. Dectrot of the Louviers, are reputed to have been of great beauty; and in the delicacy of texture, and softness, to emulate the rich shawls of Cashmere. These particulars will be sufficient to shew what real utility the cultivation of the vicuna with due attention might become hereafter in Europe.

**Camelus Paco,** the *pacos, alpacos,* and *alpague* of various authors, an animal nearly resembling the vicuna, and specifically distinguished by having no bunches; body woolly; and coat oblong.

This species is said to be entirely confined to Peru, where the natives keep wall flocks of them for the sake of their wool, of which they prepare cloth of a silky luster and softness: Like the vicuna, it is found in mountainous districts in large herds, but is never observed to associate with those animals. Some say it is of a more robust make than the vicuna, and is covered with very long wool, which, in the wild animal, is of a dull purple colour, beneath white, and when tamed, varying with black, white, and tawny.

The pacos are considered as a subordinate kind of animal to the llamas, much in the same proportion as we value the alpaca with regard to the horse: they are smaller, and not so serviceable, but their fleeces are more useful. Their wool is fine and long, only of a coarser quality than that of the vicuna, and, with the latter, forms a considerable article of merchandise in South America.

In a domestic state, the pacos are called by the Peruvians *alpagues.* The natural colour of the wool or fleece of the wild pacos, which resembles that of a dusky rove, or rather more inclining to purple brown is so fixed, that it undergoes no alteration under the hands of the manufacturer. They not only make good gloves and fleecings of this wool, but also weave it into quilts and carpets, which sell at a high price, and form a valuable part of the Spanish commerce. The pacos possess many things in common with the llamas: they belong to the same country, and are nearly of the same disposition and manners: they bear much resemblance in figure to the llamas, but are smaller: their legs shorter, and their muzzles thicker and clover.

The wild pacos inhabit and pasture on the highest parts of the mountains. Snow and ice seem rather to refresh than to be inconvenient to them: they keep together in flocks, and run swiftly. They are timid animals, for as soon as they perceive any person, they take flight, driving their young before them. The ancient monarchs of Peru rigorously prohibited the hunting of them, because they multiply so freely; but since the arrival of the Spaniards in those parts, their number is greatly decreased. The flesh of these animals is not so good as that of the huanaco: they are chiefly sought after for their fleece, and the bezoars they produce. The method of taking them proves their extreme timidity. The hunters drive a flock of them into a narrow passage, across which they have stretched cords about four feet from the ground, with a number of pieces of linen or woollen cloth hanging to them. The animals are so intimidated at these rags, agitated by the wind, that they flop, and crowding together in a heap, are killed with the greatest ease. But if there happen to be any of the huanacos among the flock, as they are less timid than the pacos, they leap over the cords, and the example being followed immediately by the whole drove, they escape for that time from their pursuers.

As to the domestic pacos, they are employed to carry burdens, like the llamas, but they can only bear a much less weight in proportion to their size than the llama, seldom carrying more than from fifty to seventy pounds. They are, besides,
The climate of the late Mull. is fine. of the milk of these animals, because they have scarcely enough to supply their own wants. The milk is derived from their wool imported by the Spaniards to endeavour to naturalize them in Europe: they transported numbers of them to Spain with this view, but the climate not agreeing with their nature, they all died. Those who brought them into Spain did not consider that they cannot exist even in Peru, but in the coldest regions, and on the summits of the loftiest mountains: that they are never found in the valleys, and if transported to warm countries, cannot long survive the change from their natural climate. Had they been sent to the Pyrenees, or other Alpine regions, it is possible they might have ascended the mountains till they found of themselves a climate suited to their nature. At least, the experiment must be ever fruitless, unless they can be accommodated with a climate as nearly agreeing with their own as the coldest parts of Europe will allow.

Such animals as subsist on vegetables, and live on the high mountains of Asia and Africa, produce that kind of animal concretion called bezoar, the virtues of which were formerly so highly extolled. The pacs produce that particular sort known by the name of ocidental bezoar, in great abundance, as do also the humaenas, and the rest of the bacta tribe, or Peruvian camels, but it is only from those animals, when in a state of nature, that bezoar of any value can be obtained. See BEOZAR.

The paco is considered by some naturalists as an animal forming an intermediate species between the llama and vicuña. Molina, in his "Voyage to Chili," has given a good description of the paco, the result of which proves, that the paco is more robust than the vicuña, has a much longer muzzle, and fleece of lower wool, but not so fine. The Peruvians keep vast flocks of them for the sake of their wool, with which they fabricate flannel that have the brilliancy of silk. This animal, which appears, however, to be so abundant in Peru, we are told, is not found in Chili, either wild or in a state of domestication.

CAMELUS, in Zoology, a species of Trichoda, found in vegetable infusions. This is thickish, hairy, before, and emarginate on each side in the middle. Müll. Zool. Don.

CAMELUS, camelus indicus, camelus indicus vericolor, and camelopard of different writers are synonyms of the Linnaean camo cameloparzalis, and Gmelinius cameloparzalis Gifruta, which sec.

CAMAEN, or KAMEN, in Geography, a town of Germany, in the circle of Welfala, and county of March; 20 miles s. of Munster.

CAMENZ, a town of Lusatia; 21 miles N.E. of Dresden, and 13 W.N.W. of Budissa.

CAMAERIA, in Antiquity, derived from the old German name, Camer, crooked, whence our English kamo, arms in kamo. At first itfigured any winding or crooked plot of ground, as " unam cameram tern," i.e. a nook of land. Afterwards the word was applied to any vaulted or arched building; and it was used in the Latin law-proceedings for the judge's chamber, &c. " camera flabella," the flarchamber, &c.

CAMAERIA, or CAMERIA, called also Camera, in Geography, a city of great note in Umbria. See Camera.

CAMA, ital. a chamber. This word, when joined to another, becomes a musical term: as musica di camera, compositions for a small band; voce di camera, a feeble voice.

Musica di camera is one of the three species of composition under which all music may be comprised: musica di chiesa, church music; musica teatrale, theatrical music, including music for public concerts; and musica di camera, chamber music.

Camera flabella, a contrivance for blowing the fire, for the fusion of ores, without bellows; by means of water falling through a funnel into a close vessel, which feeds from it so much air or vapour as continually blows the fire: if there be the space of another vessel for it to expatiate in by the way, it there lets fall its humidity, which otherwise might hinder the work. The contrivance was named camera flabella by Kirchiner. Hook, Phil. Coll. No. 3. p. 82. See BELLOWS.

Camera incisa, a contrivance of Dr. Hook for making the image of any thing appear on a wall in a light room, either by day or night. Opposite to the place or wall where the appearance is to be, made a hole of at least a foot in diameter, or if there be a high window with a casement of this dimension in it, this will do much better without such hole, or casement opened. At a convenient distance, to prevent its being perceived by the company in the room, place the object or picture intended to be represented, but in an inverted situation. If the picture be transparent, reflect the sun's rays, by means of a looking glass, so as that they may pass through it towards the place of representation; and to prevent any rays from passing aside it, let the picture be encompassed with some board or cloth. If the object be a flat one, or a living creature, it must be much enlightened by calling the sun's rays on it, either by refraction, reflection, or both. Between this object and the place of representation put a broad convex glass, ground to such a convexity, as that it may represent the object distinctly in such place. The nearer this is situated to the object, the more will the image be magnified on the wall, and the further the lens or such diversity depending on the difference of the spheres of the glasses. If the object cannot be conveniently inverted, there must be two large glasses of proper spheres, situate at suitable distances, callidly found by trial, to make the representations exact. This whole apparatus of object, glasses, &c. with the perfections employed in the management of them, are to be placed without the window or hole, so that they may not be perceived by the spectators in the room, and the operation itself will be easily performed. Phil. Trans. No. 38, p. 741, &c.

Camera Obscura, or Dark Chamber, in Optics, a machine or apparatus so constructed, that principally by means of a convex glass, or a convex glass and plane mirror, the images of external objects are represented on a rough ground plane glass, white paper, white wall, or other surface, in the most vivid and distinct manner, with all their natural motions, colours, shades, &c. The first invention of the camera obscura has been ascribed to Baptista Porta.—See his Magia Naturalis, lib. xxiv. cap. 6, first published at Frankfort about the year 1589 or 1591. The first four books of this work were published at Antwerp in 1572. But Dr. Friend, in his "History of Physic," (vol. ii. p. 256) observes, that Friar Bacon, who flourished in the beginning of the 13th century, describes the camera obscura, and all sorts of glasse, which magnify or diminish any object, bring it nearer to the eye, or remove it farther off. See also Bacon's "Opus Majus" by Dr. Jubb, p. 256; and his Epistle "Ad Pariliens," and his "Perspective" cited by Dr. Plot in his "History of Oxfordshire," p. 253; from which we may conclude, that he had a very accurate and extensive acquaintance with the properties of various kinds of glasses.

Camera Obscura, the use of the, is manifold: it affords very much in explaining the nature and rationale of vision, and
C A M E R A.

hence by some it has been compared to the artificial eye. It exhibits the most striking and entertaining representations of objects of all descriptions, whether near or distant, in their true perspective, the colouring full and natural, their light and shadows correct, and all their motions and relative positions according to the original. By means of this instrument, a person however unacquainted with drawing may delineate objects with great facility and correctness; and to the skilful artist it will be found indispensably useful in comparing his sketches with the perfect representations given in the camera, and by observing his defective imitations, he may correct, as much as possible, his designs. To the delineations of that beautiful representation called the Panorama, this instrument has proved of essential use.

Camera Obscura, the theory of the, is contained in the following proposition.

If an external object, as A, Plate III. Optics, fig. 1, radiates its light through a small aperture C, in a shutter of a perfectly darkened room upon a white paper or painted screen opposite to it, an image of the object will be depicted on the screen in an inverted position. For the aperture C being suppos'd very small, the rays issuing from the point B will fall on b; those from the points A and D will fall on a and d; wherefore, since the rays issuing from the several points are not blended, they will, by reflection, exhibit its appearance on the screen. But since these rays, A C and B C, intersect each other in the aperture, and the rays from the lowest points fall on the highest, the situation of the object will necessarily be inverted. Hence, since the angles at D and d, and the vertical ones are equal at C, B and b, and A and a, will be also equal; consequently, if the screen where the object is delineated be parallel to it, a b : A B :: a C : D C.

That is, the height of the image will be to the height of the object, as the distance of the image from the aperture is to the distance of the object from the frame. This proves, therefore, that the inversion of the object is not owing to any lens that may be used in a camera obscura. In this manner, the figures of the image are very faint and confused, for want of a due degree of light, and its proper refractions.

Camera Obscura, consideration of a, whereon the images of external objects are distinctly represented in their genuine colours, light and shade, &c. and either in a erect or inverted position.

1. Darken, in the most perfect manner possible, a room or chamber; in the shutter of one of the windows that faces the object to be represented, cut a small circular aperture, see fig. 1. C.

2. In this aperture fix either a double or plain convex lens; if the latter, with the convex side next the object. Its focus may be of any length between 3 and 6 feet.

3. At a proper distance, to be determined by experiment, or about the focal distance of the lens, place perpendicularly a large surface of white paper or cloth, and on this the images of the external objects directly before the lens will be beautifully delineated, but in an inverted position. The paper or cloth should be moveable, so that the exact distance of the focus of the lens may be obtained, or the images will not be seen with their utmost distinctness. Those objects also should be selected that are in the strongest light, or illuminated by the sun's rays. In northern latitudes at noon-day, a window opposite the north is best; in the morning, facing the west, and in the evening facing the east. In southern latitudes a window facing the south is best at noon. The shorter the focus the smaller and brighter the images will appear; and the longer, the larger the objects; but if the focus be very long, from 20 to 60 feet, the same light being more dilated or spread over a large surface, the images will appear somewhat obscure, and the colouring fainter. The images will be full brighter if the spectator first lay a quarter of an hour in the dark.

This is the most perfect method of obtaining a representation of objects, from having but one reflecting medium, but in some cases the inverted position of the images may be some objection; to obviate which, the following methods may be used to make the picture erect. Hold a true ground plain mirror flatwise against your breast, under an acute angle, and looking therein, you will see all the images reflected to their natural and erect position, and with an addition of light that they will receive from the reflection of the mirror. Or, which is a better way, and does not require a mirror near so large, place a mirror above and rather near the lens, so as to reflect the rays down upon a white surface, a screen directly under, or parallel to the mirror. Or, a large concave mirror may be placed before the picture, at such a distance that the image of the picture may appear before the mirror, which will then be erect, and appear pendant in the air. Another method, which is more direct, is by placing another convex lens in a partition behind the paper or screen, with the image at twice the focal distance of the field-lens, the axes of the two lenses coinciding, in which case another picture of the images will be formed but erect, as large as the first, but not so bright, and with a contracted field or extent of the picture. Or, two lenses of short focal in draw-out tubes, may be applied to the hole in the shutter instead of one, which will also produce an erect position of the images, but the light will be less, the extent very limited, and serve only for the representation of objects, small figures, &c. as hereafter to be described. This method is but of little use and seldom practised.

The following description of cameras obscuras has been communicated to us by Mr. William Jones, optician, Holborn, as being the most commodious and perfect, and what have been preferred, and are in general use, by the most skilful artists:

Fig. 2. represents the spheric ball, which is made of mahogany, and consists of three parts, a frame, a ball, and a lens. The frame consists of two pieces a circular wire rim, fitted one to the other, and both fo excavated as to admit, and keep a spherical ball perforated, which is valuable in its frame more or less easily, as the parts of the frame are less or more screwed together. At each end the hole in this ball is a screw cell for containing a lens; these lenses are of different focal lengths, and only one is to be used at a time, when the images are to be formed. The frame of this spheric ball is to be screwed fast to the window-shutter or window-board of a well-darkened room, before a hole previously made therein. There are two brass nuts and screws, a, b, fitted to the frame for that purpose; the nuts are screwed to the shutter or board, so that by means of the screws the spheric ball may be more readily attached to, or detached from, the shutter. This apparatus is very convenient, when experiments by a variety of lenses may be desired. As, fig. 2, represents the position of a mirror when applied for reflecting downwards the images in order to obtain the erect positions; if the frame be made to turn on a hinge, it will be the more useful to direct the image to an oblique screen, or table, as may be required. Fig. 1. represents a darkened room with a lens attached to the spheric or shutter, or where the spheric ball is to be placed. E represents the moveable white paper screen that receives the images of the objects formed by the lens, and is moveable to the distance of the focal length of the glasses. A B shews the manner in which the ball, b.
The Scopic Ball affords a very convenient method of forming an image of the sun in the darkened room. If a lens 10 or 12 feet focus be placed on it, and a white paper screen placed at its focus, in a perpendicular position to the rays, a distinct image of the sun will be formed, about one inch diameter, on which will be conspicuously exhibited all the spots or solar maculae. At the time of a solar eclipse, the whole progress of the moon, from the time of the first contact of the limbs to the last, may, in this way, be observed very distinctly. But the best method is by connecting a draw-out telescope, with the ball of theocket, fig. 2, by screwing the end with the object glafs to it, and taking out all the eye glafes at the other end, except the one next to the eye, then moving inwards the frif tube till the image of the sun appear distinct; and you will have a bright image from 12 to 26 inches diameter, according to the distance of the screen, which will, to any number of spectators, exhibit the solar phenomena intended to be viewed.

Confirmation of a Chamber Camera Obfcura.

The foregoing is the readiest and most simple method of converting a room into a camera obfcura, but it is attended with these objections, that it only serves for objects directly facing the lens, and occasionals the trouble of darkening the room, fixing and adjusting the apparatus, &c. Fig. 3, represents a room shaded like a dome or cupola, placed over a building, prospect-room, or temporary room erected for the purpose of a camera obfcura, and in this way affords the most ready and advantageous plan for all surrounding objects. The whole dome A B may be made to turn round on friction wheels, in a groove made in the roof for that purpose, and to carry round with it the glafes in the box C above, or which, in some cafes, is a more manageable way, the box with the glafes is made moveable in a groove round upon the dome, and is turned by means of a long rod by a perfon within. The manner of fabricating such a dome and box will be evideit to any good joiner by a mere inspection of the figure. The mahogany box C is of a cubical form about 6 or 7 inches in the length of a fide; a true ground mirror in a frame is placed diagonally in the box, and is moveable somewhat on an axis at its lower edge upwards and downwards, to reflect the rays from objects at various dilfances; underneath this mirror, in a round cell, at the bottom of the box, is fixed a double convex lens, about 6 or 8 feet focus, and 4 or 4½ inches in diameter; this lens will form upon a white table D, placed on the floor below, the images of the objects reflected by the mirror above, at the focal distance of the lens. The diameter of this table should be 12 or 13 feet, excavated on its surface to a small degree of concavity, or from a radius about the focus of the lens, in order, that the inequality of the distance of its surface from the centre of the lens, presenting the images indifinct at the circumference, when they are clear in the middle, may be obviated. The surface must be painted perfectly white, or, which is better, covered with thin coating of plaster or stucco. The pillar of the table should be made with a screw working in a female one cut in the pedefral, so that by turning round the table and screw its surface may either be elevated or depressed, as may be necessary, to admit of the clear and best defined picture of the images possible. To persons having dwellings on elevated situations commanding extensive prospects over countrysides, the lens, &c. a machine of this kind contrifuted over it will afford more delight and entertainment, as well as life to an artist, than any perfume would suggest, who had not previously been a witnelf to such an effecf. To those who may not wish to be at the expense of a dome, Mr. Jones recommends the box fitted to a wooden pyramidal trunk, (fig. 4,) which trunk can be fixed on the ridge of the roof of a houte or chamber, by a common carpenter, and a flat sliding cover to slide on at A, to cover the trunk when the box of glafes B is taken away after use. The camera boxes, with the glafes complete, and ready for fixing, are made by Meffrs. Jones, of Holborn, and other Opticians. Metallic mirrors have been used instead of glafes ones for cameras; they reflect more light, and consequently flew the images brighter, but their liability to tarnifh and corrode is an unavoidable objection to their general ufe.

Cameras Obfcuras, conftruction of portable. The glafes of a camera obfcura are frequently fitted to a portable machine slitting up in the form of a cheff, or box, to as to be portable, and easily transported from place to place, and carried about by the artist. The apparatus within is contrivd to fold outwards, and form a machine as represented at fig. 5, and it is contrivd upon the most convenient plan of any hitherto conftucted. It is represented as placed together for ufe. The lid front A, and the slides, one drawn at B, by means of hinges turn up to the height of about two feet from the cafe C D E, and are faftened together by small brafs hooks. The head and sliding box, with glafes F, also faften on by hooks within. The lens of about 2 inches focus is placed under the true parallel glafs mirror, and forms the images on a white sheet of paper, placed in the bottom of the cheff. To view the images the face is applied close to a piece under A for that purpose, and to trace the outline, or copy them, the arm at the fame time is applied in the cloth fleece under H. The box F slides on a square tube, and by means of a brafs rack and pinion G the lens is adjufted, while the images are viewing, to its proper focal distance from the white paper below. The images formed on the paper have a correct and natural refeemblance to the original objects; no version takes place, and even names and letters on objects are in their direct order. This camera is converted into an instrument for magnifying perspective prints and drawings, and forms the best possible apparatus for that purpose. The head F G and tube are to be entirely removed, as well as the front A, and cloth C D, and another head with a diagonally-placed mirror and large convex lens, fig. 6, substituted, and also faftened. The prints are to be placed at the bottom of the cheff, and as the camera is open, the print will be illumined either by day light or candle light, as required. The print is viewed by reflection in an horizontal direction, by the eyes being placed before the large convex lens. When the sides and front are unhooked and folded down into the cheff, they all lie fide by side, and admit the head to lie under them; and the dimensions of the cheff, when thus shut up, do not exceed 2 feet in length, 20 inches in breadth, and 5 inches in depth.

The most portable kind of Camera obfcura is that represented at fig. 7, and is that most frequently used among artists, on account of its convenient dimensions. The images are reflected on a rough ground plane glafs, and are more vivid than those formed on paper, by the Camera above described. It is made of mahogany, and of various dimensions.
same so small as to be carried in the pocket. The lens at the front A is fixed in the cell, in the front of a square draw-out tube, and is of a focus equal to the length of the box when the drawer is half drawn out; and a plain mirror is placed diagonally at the angle of 45°, at the end of the box, as shown by the dotted line a b, which reflects the rays transmitted by the lens up to the upper side of the plane rough-ground glasses, the rough side placed above, under the folding darkening cover, and there forming the images of the objects before the lens at A: the use of the draw is to adjust the proper distance of the lens from the mirror, according to the variable distances of proximate objects. The images on the rough glasses exhibit a beautiful perspective picture, also the profile of a person seated in a room in a strong light before the camera, and more particularly if the sun illumine the object; and may be readily traced on the rough surface of the glasses by a black lead pencil, or by what is preferable, red French chalk, and then white paper being gently placed on the glasses, the lines will be taken correctly off. If very thin white paper is merely placed upon the glasses, the images may be discerned, though faintly, sufficient to afford the idea of tracing correctly. The nearer the object or features are to the camera the larger will be the image, and an additional lens of a shorter focus is sometimes fitted to be sublimated for the other, when the images of near objects are wanted. Some artists who take profiles take out the rough glasses from their cell, invert the camera, and by a stand support it about 10 or 12 inches above the white paper on the table. The image will then invertedly be formed on the paper, and they trace it with a pencil in a correct manner, and with less trouble than by the other method. Merris Jones, of Holborn, make an improved camera of this kind, by joining the side of the camera and drawer in the middle with canvas cloth, as shown at the lines D G: the back C turns inward with the mirror, close up to the rough glasses, and the front E F above, over the top, so that the whole camera may fold down into a flat form, and go into a very portable flat leather flip case, making it the most portable possible for persons travelling. Inclusive of the rough glasses has sometimes been placed a double convex lens to relieve the images, and from more light being thus refracted, the images are shown with great beauty and extraordinary brightness, even surpassing the original. They are also more vivid when the rough glass is placed over this lens, though the contours, or outlines, are not so sharp or distinct as when the rough glass is used only by itself. This improvement was obtained some years ago, by a pervert of the name of Storer, a discoverer, and called a delineator, but without the least pretensions, it being previously well known by the most eminent opticians, and it was, in the year 1778, noticed by Mr. Hooper, in his Rational Recreations, vol. ii. p. 29. Guyot's Recreations Physiques, tom. ii. recr. 35. art. 2. Mr. Harris, in his "Optics," b. ii. § 4. has described a variety of contrivances for converting the portable camera into a draw box for viewing prints.


Gen. C. Chal. antheria one leafed, small, with five acute teeth. Cor. tunneled; flange long, swelling out at the base and at the top; border flat, with five lanceolate oblique segments. Stem. filaments five, small, attached to the middle of the tube; anthers converging. Fil. germs two, with lateral appendages; style scarcely any; stigma obscure. Peric. foliaceous two, horizontally reflexed, oblong, crenated, obtuse at both ends, with two opposite teeth at the base of each. Seeds numerous, egg-shaped, compressed, with a membraneous ring at their base by which they are attached to the receptacle through a in single row, in an inflated manner, and inverted direction.


CAMERARIUS (Dillen.), See Montia fontana. CAMERARIAU, or Chamberlain, in Antiquity, an officer who had the care of the dormitory in ancient religious houses.

CAMERARIUS, Joachim, in Biography, an elegant German scholar and biblical writer, was born at Bamberg in Franconia in 1504; and was no less distinguished for his eloquence than for his knowledge of the languages, history, mathematics, and politics. He was honoured with the friendship of Charles v., Maximilian ii., and other princes; and by the diligence and zeal with which he delivered his courses at Nurenberg, Tubingen, and Leipzig, he very much contributed to promote the cause of universal science, and more especially the study of elegant literature. He translated from Greek into Latin parts of Herodotus, Demosthenes, Xenophon, Ecstatic, E. Kant, Thucydides, Sophocles, Lucian, Galen, Chrysostom, Theodoret, Aristides, Nirpilor, Gregory of Nyssa, St. He also wrote in Latin the lives of Melancthon and Heiligen; and composed "Commentaries on the New Testament," in which, says Moehring (Eccl. Hil. vol. iv.), "he expounds the scriptures merely in a grammatical and critical manner; and laying aside all disputed points of doctrine and religious controversy, unfolds the sense of each term, and the spirit of each phrase, by the rules of criticism, and the genius of the ancient language, in which he was a very uncommon proficient." The last ed.
tion of this commentary was printed at Cambridge in 1642.
It is bound with Bexa's Greek Testament, printed at Cam-
bridge in the same year. Camerarius frequently quotes a
MS. which he describes as ancient, and which is noted 88
in the first part of Wetstein's New Testament. He likewise
published a catalogue of the bishops of the principal fees;
Greek epistles; accounts of his journeys in Latin verse;
epigrams of the ancient Greek poets; a commentary on
Philus,; and several other learned works. T urnebus,
H. Stephens, Lipsius, Bexa, and many others distinguished
for their literature, concur in bearing ample testimony to his
talents and learning. He died in 1574; and left several
sons, who were eminent for their literary attainments. Gen.
Dct.
 Camerarius, Joachim, a physician of learning and emi-

nence, was born at Nuremberg in 1534, where he received
the rudiments of his education. As his mind was early
turned to the study of botany and medicine, with the view
of improving himself, he visited the principal seminaries in
Germany, and thence went to Padua, and afterwards to
Bologna, where he took the degree of doctor in 1562. Two
years after he returned to Nuremberg, and by his zeal and
ability, aided perhaps by the high character his father had borne, who was esteemed one of the refiners of
literature, he conciliated to himself the favour of the prin-
cipal perfonages in the city. Under their patronage, in 1592,
he founded a medical college, of which he was appointed
dean or president, and in that situation continued to direct
the affairs of the institution for the remainder of his life.
Mindful of his favourite object, botany, he formed an ex-
tensive garden, flored with the choicest plants, the cultivation
of which he superintended with great affinity. He also
affiliated the landscape of Hesse with his advice in forming a
botanical garden; and with a view of disseminating the
knowledge of plants, he purchased the collections of Gesner
and Wolf, which he methodized, and corrected, and with
considerable additions from his own florbes, together with the
works of Matthiolus, he published them in 1586, under the
title of "De Plantis Epitome uttillium Petri Andreae Mat-
tholii novis Iovibus et Decriptionibus plurimis diligenter
aucta." 4to. " Hortus Medicus et Philosophicus, in quo
plurimarum Stirpium breves Deescriptiones, nova leones non
paene, continentur," 4to. 1588. " Opera de Re Rura,
quibus, preter alia, Catalogus Rei Botanicae et Rurae Scrip-
torium veterum et recentiorum infectus est," 1577, 4to.
Also " De recta et necessaria Ratione corporis et Saltus
Contagiosum." 1583, with other smaller tracts on the same
subject, and three centuries of emblems. On his death,
which happened October 11, 1593, he was succeeded by his
son Joachim, in his practice and in the honour of being
 Camerarius, Elias Rodolph, son of Rodolph John
C., a physician of eminence at Tubingen, was born in 1590.
Following the steps of his father, he was made doctor, and
soon after professor of medicine in the university of Tubingen,
which office he held to the time of his death, which hap-
pended on the 7th of June 1695. He was author of nume-
rous differtations on the subject of medicine, in which are
detailed such rare cases as had occurred in his practice.
Among them, "Histo­ria Anatomica Renum et Vetere,"
1683, 4to. In this he gives an account of a distention of
a person who died of an affection of the kidneys. Of one of
the kidneys there only remained the external membrane,
which was full of purulent matter, into which the kidney
had been resolved.
By his father "Syllogis Memorabilium Medicinae, et Mi-

pope's apartment in the Vatican; and whenever he goes abroad is attended by the Swiss guards, like the pope himself. He even coins money in his own name, and with his own arms; and, in fine, is a kind of vice-pope, governing the ecclesiastical state during the vacancy of the holy see.

The cardinals have also their камериллоi, or treasurer of their college, distinct from that of the pope; the former is elected every year, whereas the latter is for life. The person chosen to this office has the receipt of all the revenues belonging to the college, which he is to distribute at the end of the year in equal portions to the cardinals then at Rome; those who are absent having no share therein after they have been six months from court.

CAMERON, John, in Biography, one of the most famous divines amongst the Protestants of France, in the 17th century, was born at Glasgow, in Scotland, about the year 1629, and taught Greek there, till he removed to Bourdeaux in 1650. Here he acquired such celebrity by the fluency with which he spoke Greek, that he was appointed to teach the learned languages at Bergeac. He afterwards became professor of philosophy at Selan; but returning to Bourdeaux in 1634, he devoted himself to the study of divinity. Upon being appointed tutor to the sons of the chancellor of Navarre, he accompanied them to Paris, Geneva, and Heidelberg. After having discharged the office of a minis¬ter at Bourdeaux, which he assumed in 1668, for 10 years, he accepted the professorship of divinity at Saumur. Upon the dispersal of that academy by the public commotions in 1621, he removed to England, and taught divinity at his own house in London. King James, inclined to favour him on account of his supposéd attachment to the hierarchy, made him master of the college, and professor of divinity at Glasgow; but after holding this office, which he found to be unpleasant to him, for a year, he returned to Saumur, where he read private lectures. From thence, he removed in 1624 to Montauban; where the disturbances excited by the emissaries of the duke de Rohan, led him to renounce the principles which produced them, with more zeal than prudence. This occasioned his being insulited by a private person in the streets and severely beaten: and this treatment so much affected him, that he soon after died, in 1625, at the early age of 46 years. Bayle represents him as "a man of great parts and judgment, of an excellent memory, very learned, a good philosopher, good-humoured, liberal not only of his knowledge, but his purse, a great talker, a low-minded preacher, little versed in the fathers, inflexible in his opinions, and inclined to tur¬bulence." He was one of those who attempted to reconc¬ile the doctrine of predestination, as it had been taught at Geneva, and confirmed at Dort, with the sentiments of those who reprefent the deity as offering the displays of his goodness and mercy to all mankind. His opinion was main¬tained and propagated by Mofes Amyraut, and several others of the most learned among the reformed ministers, who thought Calvin’s doctrine too harsh. They were called Universalists. Cameron likewise maintained the possi¬bility of salvation in the church of Rome. After his death, his theological lectures were printed at Saumur, in 3 vols. 4to. 1626-28; and afterwards with some additional pieces, at Geneva, in one vol. fol. His remarks on the New Te¬fament, under the title of "Myrothecium Evangelicum," were printed at Geneva in 1632. Gen. Dict. Mohlin, E. H. vol. v.

CAMILLA, a river on the west coast of Africa, S.E. from Calabar river, the entrance of which is N. lat. 4°, and E. long. 1° 20'.

CAMERON, See CAMERON.

CAMERONIANS, in Ecclesiastical History, a sect or party in Scotland, who separated from the Presbyterians in 1666, and continued to hold their religious assemblies in the fields.

The Cameronians took their denomination from Richard Cameron, a famous field-preacher, who refusing to accept the indulgence to tender conscienties granted by king Charles II. as such an acceptance seemed an acknowledgment of the king’s supremacy, and that he had before a right to silence them, made a defec¬tion from his brethren, and even headed a rebellion, in which he was killed. His followers were never entirely reduced till the revolution, when they voluntarily submitted to king William. The Cameronians adhered rigidly to the form of government estab¬lished in 1648.

CAMERONIANS, or CAMERONITES, is also the denomina¬tion of a party of Calvinists in France, who affirmed, that the cause of men's doing good or evil proceeds from the knowledge which God infuses into them; and that God does not move the will physiologically, but only morally, in virtue of its dependence on the judgment of the mind. They had this name from John Cameron, of whom an account has been given under the article CAMERON.

The Cameronians are a sort of mitigated Calvinists, and approach to the opinion of the Arminians. See Universalists, hypothetical.

CAMEROTTA, in Geography, a town of Naples, in the Principato Cita; nine miles S.W. of Policastro.

CAMERTA, in Ancient Geography, a town to the right of the route from Otrochi to Rimini. Strabo.

CAMES, in Geography, a town of the island of Cuba; 40 miles W. of Bayamo.

CAMES, in the Manufactures, a name given to the small slender rods of salt-lead, of which the glaziers make their turned lead.

Their lead being cast into slender rods of twelve or fourteen inches long each, is called the camé; sometimes also they call each of these rods a came, which being afterwards drawn through their vice, makes their turned lead.

CAMICUS, CAMICI, and CAMICOS, Platouella, or Plat¬toula, in Ancient Geography, a town of Sicily, on the banks of a river of the same name, N.W. of Agrigentum. The river falls into the sea near Capo Bianco, so called from its colour.

CAMIGARA, a town of India, on this side of the Ganges. Ptolemy.

CAMIGUIN, in Geography, one of the Philippine islands, about 10 leagues in circuit, and known by two high woody mountains. N. lat. 9° 30'.

CAMILLIANUM, in Ancient Geography, a town of Italy, in Umbria, inhabited by the Camelani.

CAMILLA, in Entomology, a species of Papilio, (Nymph. Phal.) found in Europe. The wings are indent¬ed, black, glossed with blue, with a white band on both sides, and spot of the same; posterior wings beneath at the base silverly and immaculate. Fabr. &c. This is papilio lucella of Esper, and papilio rivularis of Scopoli. This species described by Esper under the name of camilla, is not the above insect, but the Fabrician P. lucella.

CAMILLI and CAMILLÆ, in Antiquity, boys and girls of ingenious birth, who ministered in the sacrifices of the gods;


CAM

Gods; and especially those who attended the flamen dialius, or priest of Jupiter.

The word seems borrowed from the language of the ancient Etrurians, where it signified minifter, and was changed from caelestias.

The Tusculans also gave the appellation Camillus to Mercury, in quality of minister of the gods.

CAMILLUS. Marcus Furius, in Biography, one of the Patrician family of the Parii at Rome, by whom it was first raised to eminence. In the year of Rome 353 he served the office of censor, and in the 14th year of the siege of Veii, B. C. 395, he was created dictator, defined, says Livy, by the fates to take the city, and to live in his country. After previous vows, Camillus prepared for prosecuting the siege with vigour; and having defeated the united force of the enemy in the field, he led his army to Veii. The assailants from without being aided by a chosen band who had entered the city by a mine which had been constructed under the walls, and carried as far as the citadel, Veii, which had been the rival of Rome in power, and its superior in splendour, was obliged to surrender amid the shrieks and lamentations of the inhabitants, and after having exhibited a scene of blood and slaughter, which made even Camillus shed tears of sympathy and compunction. Eliminating the opulence of the city by the spoils which it yielded to the victors, and reflecting on the importance of this conquest, which had been delayed ten years, Camillus is said to have lifted up his hands to heaven, and to have implored the Gods, that "if his own and the good fortune of the Romans appeared too great in their sight, and that it was necessary to counterbalance it by some disgrace, that they would be pleased to cause it to fall on him alone, and to spare the commonwealth." On the day after the capture of Veii, the prisoners were fed for slaves, and the sums thus raised remitted to the public treasury. The triumph of the dictator was magnificently celebrated, and the chariot of the victor was drawn by four white horses; but the pomp and splendour of it offended the Roman people; and Camillus, who from this time was regarded as the head of the Patrician party, became an object of popular jealousy. Camillus, however, after having fulfilled his vows, abdicated the dictatorship. Two years after this event, Camillus was again chosen one of the military tribunes, and entrusted with the conduct of an expedition against the Falisci. Having invested Falerii, the capital of those people, an incident occurred, which afforded him an opportunity of displaying a degree of justice and generosity, that was highly honourable to himself and to the Roman character. A schoolmaster of the place, to whose care the children of all the most illustrious persons were committed, contrived, under a pretence of exercising them in those appropriate sports to which they were accustomed, to bring them to the Roman lines; and, upon being led to the Roman general, he delivered them into his hands, informing him, that with these children, he in effect surrendered to him the town which he was besieging. "Traitors," said Camillus, with a menacing aspect, "if you do not address yourself with your impious pretences either to a general or a people that resemble you. We have indeed no express and formal alliance with the Falisci, but that which nature has established between all men both doers, and shall subsist between us. War has its rights, as well as peace; and we have learned to make it without any injustice to all persons, even in cities taken by assault, but against men, armed like ourselves; men, who without any previous injury from us, attacked the Roman camp at Veii. Thou, to the utmost of thy power, hast exceeded them by a new and different kind of crime; but for me, I shall conquer as at Veii, by Roman arts, by valor, works, and perseverance." After this reproof, Camillus ordered the traitor to be hanged, and to have his hands tied behind him; and providing his young scholars with rods, he directed them to drive him back into the city and to scourge him all the way. Upon their arrival, the citizens, overcome by this influence of generous conduct on the part of Camillus, sent deputies to treat of a surrender. Camillus referred them to the Senate, who admitted the Falisci into the number of the allies of the Romans, on condition of their defraying the expenses of the war. The noble general returned to Rome with a much more splendid glory than that of his superb and pompous triumph after the capture of Veii. The army, however, was in no small degree irritated by being disappointed of its expected plunder.

Four years of turbulence succeeded the surrender of Falerii, during which Rome underwent the changes of a return to the confuneral government, of an interregnum, and of a renewal of the administration by military tribunals. Whilft the Gauls in their irruption into Italy had advanced as far as Chfium in Etruria, the Romans were heedless of their danger; and encouraged a prosecution against their general Camillus, on a charge of having embezzled some of the spoils of Veii. Well informed with regard to the issue of this prosecution, he resolved to prevent the indignity of a formal condemnation by a voluntary exile. Having taken leave of his family and friends, he advanced in silence towards the gates of the city; and then turning about and stretching his hands towards the capitol, he supplicated the Gods, "that if he were innocent, they would make his unfortunate country regret his absence as soon as possible." He then retired to Ardea; and the Romans imposed upon him a heavy fine. In the course of the Gallic war, a party of the Gauls, which had been ravaging the country, whilst Brennus their general was besieging Rome, was led by chance towards the city of Ardea. Camillus, as soon as he heard of their approach, round the inhabitants to arms in their own defence. His efforts were not ineffectual; under his conduct they marched out to meet the enemy; and falling on them at night, when they had abandoned themselves to incontinence and disorder, a great slaughter ensued; the whole body of them was dispersed, and most of those who escaped were killed by the inhabitants of the country of Antium, whither they had fled. The fame of this victory soon spread through the neighbouring cities; and the Roman fugitives at Veii were encouraged to rally, and intreated Camillus to take them under his command. With this request he delayed complying, from regard to the laws of his country, till the citizens in the capitol had confirmed their choice. But as the city was invested by the Gauls, it was difficult to gain access to this fortress. An intrepid youth, however, undertook the charge; and, upon his arrival in the capitol, the senate was assembled; and he returned as speedily as possible with a revocation of the decree by which Camillus had been condemned, and an unanimous nomination of him to the office of dictator. Camillus, thus reinforced with authority, invited the dispersed Romans and their allies to his camp; and soon found himself at the head of 40,000 men. With this force he fo harried the Gauls, and by cutting off their supplies reduced them to such a state of famine and petition, that they negotiated with the beleaguered citizens in the capitol; and in the issue, the Romans contented to purchase peace by a sum of gold. Livy relates, that whilst the gold was weighing, Camillus suddenly arrived at the city gates, and prohibiting the payment, the contract for which had not obtained his concurrence as chief magistrate, drove the Gauls from the city into their camp.
CAMP. "Curry back," say he to the Romans, "that gold into the capital; and as for you, Gauls, retire with your weights and I take; it is with the fond only that the Roman ought to redeem their country."

Livy adds, that Camillus paraded them in their retreat, and so completely destroyed them, that not one Gaul was left to carry home the news of their defeat. Polybius, and some other writers, affirm, that the god was actually pad, and that the Gauls marched back in fifty with their boats. Camillus, however, was duly regarded as the deliverer of his country; and his soldiers, on entering the vacant city in triumph, hailed him as Romanus, the Deliverer of his country, and the second Deliverer of Rome. This he immediately did, A.U. 357, B.C. 239. In consequence of it Camillus purified the ground with the customary expiations, rebuilt the temples, and erected a new one to Isis Latitans. See AVIS LEOPARD.

He was continued in his office of dictator for a whole year, contrary to the usual custom which limited its duration to six months; and by his counsels and influence a decree was passed for rebuilding the city, and the work was undertaken with great alacrity and arduous labour. In the year of Rome 366, a formidable confederacy was concerted against Rome by several neighbouring states, and Camillus, with a view to the suppression of it, was a third time appointed dictator. Having raised a large army for this purpose, he speedily accomplished it; and returning to Rome in triumph a third time, he laid down his office. The spoils and the rule of the prisoners yielded a large sum of money, part of which was applied for defraying the charge of three gold vases, inscribed with the name of Camillus, as a memorial of his exploit, and deposited at the foot of Janus's statue in the Capitol. In order to quell the conmotions occasioned by the ambition of Marcus, who on a former occasion had faced the Capitol from the Gauls, Camillus was a fifth time elected military tribune; and he presided at the tribunal which condemned this brave, but dangerous citizen to death. His sixth election to the military tribunalship, A.U. 374, was occasioned by the union of the Volsci with the inhabitants of Transalpine Gaul, and though he was now advanced in years, and wished to decline public service, he took the command, and completely defeated them. In the year of Rome 387, Camillus was advanced to the office of dictator a fourth time, for the purpose of compelling the differences that subsisted between the patricians and plebeians, and of maintaining the prerogative of the former. By his authority he prevented the tribunes from proposing their new laws to the people; but apprehending the threatened consequences of their refenment, and desiring to come informalities that had occurred in the mode of his appointment, he abdicated his office. The approach of an invading army of the Gauls induced the republic again to direct their wishes to him as their deliverer; so that in his 68th year, he was a fifth time appointed dictator, and he cheerfully conferred to pacify the remains of his life to the welfare of his country. On the banks of the Anio he fell unexpectedly on the Gauls, and defeated them with great slaughter. Having received the surrender of the town of Velitrae, he returned to enjoy the honour of another well-merited triumph. The turbulent state of the republic would not allow the relinquishment of his authority. The popular party determined on restoring the confederate government; and the tribunes prepared for seizing the person of the aged dictator on his tribunal. During the tumult he retired to the capital; and having implored the gods to appease the contend, and to avert its fatal effects, he made a vow to erect a temple to Concord, as soon as the troubles terminated. The voice of the people prevailed; and it was agreed, in favour of the senate, that one of the confidants should be chosen out of their own body. In order to preserve the supremacy of the patricians, Camillus proposed to separate the judicial from the executive power in the consuls, by the appointment of a praetor, who should be elected from the higher order of citizens, and administered justice at home. The power of that party was further increased by the multiplication of tribunals of patricians only. Camillus, having thus honourably closed his fifth dictatorship, and erected the temple of Concord, retired from public life; but in the year of Rome 359, B.C. 157, he fell a victim to a piety that forgot away a great number of cities in the magnificent.

"His memory was ever cherished as one of the greatest, most fortunate, and most patriotic chiefs of the Roman republic." It was a proverbial saying, much to his honour, that "wherever Camillus was, there was Rome." Thus expressed by Lucan in his Pharsalia, lib. v. v. 27—

"Unique habitante Camillo,
Ilic Roma suit."


Camilus, in Entomology, an elegant species of Papilio (Eq. Archiv.) described by Fabricius from a specimen in the Blackian Cabinet. The wings are white, with fimbriated edges of black: on the posterior ones a black caudal spot. This is of a small size, and inhabits the interior of Africa.

Camina, in Ancient Geography, an island of the Mediterranean Sea, on the coast of Alca Minor, near Miktus, and 38 miles from Plataea. Pliny.

Caminha, in Geography, a town of Portugal, in the province of Entre-Douro e Minho, seated at the mouth of the Minho, and defended by a fort and garrison: it contains about 1500 inhabitants, one parish-church, two hospitals, and two convents; 11 miles N.N.W. of Viana. Lat. 41° 44'. W. long. 9° 15'.

Camini, or sera Camini, in Botany, an American herb, the same with what is otherwise called Paraguay, or sera canoiss." Camini, in Geography, a river of Upper Canada, which discharges itself into the lake Superior, 30 miles E. of the Grand Portage.

Caminitza, a town of European Turkey, in the Morea, situated on a small gulf at the mouth of a river of the same name, anciently called Olea, and the river Mela; 24 miles N.E. of Chiroenza.

Caminos, in Ancient Geography, a place of Africa, in Cyrenaica, upon the route from the greatest Leptis to Alexandria. Anton. Itin.

Camion, in the Military Art, a sort of small tumbril, or cart with three wheels, which is commonly drawn by two men, and answers for carrying bulks, &c. It is very convenient for magazines in cities and fortresses. This name is also given to a cart with three wheels, from eight to nine feet long in the body, for moving earth with horses.

Camirium, in Botany. (Rumph. amph. ii. p. 180, tab. 38.) See Alcuretes.

Caimorl, in Ancient Geography, a town in the island of Rhodes, seated on the W. coast, 18 miles S.W. of it, and almost opposite to Lindus. This was formerly one of the three cities called Tripolis; the other two were denominated Lindus and Juliana. Of this town there remains no traces besides the name of Caimorl, a Greek village, built upon the same spot.

Caimis, or Kamis, in the Japanese Theology, denote deified souls of ancient heroes, who are supposed still to interest themselves...
themselves in the welfare of the people over whom they
anciently commanded. The camis answer to the heroes in the
ancient Greek and Roman theology, and are venerated like
the saints in the modern Roman church. Beside the heroes
or camis beatified by the consent of antiquity, the mikado,
or pontiffs, have skill'd many others, and continue still to
grant the apothecaries new worthies; so that they swarm
with camis: the principal one is Tenfis Da Sinu, the common
father of Japan, to whom are paid devotions and pilgrimages
extraordinary.

CAMISÀ, Porto, in Geography. See Liss.

CAMISADE, in the Military Art, a term denoting a
sudden or unexpected attack in the night, and for which a
common badge, mark, or signal, is agreed on to enable the
troops employed in making it to know one another by,
particularly in the dark. A white shirt or chemise, still called
camis in some of the provinces of France, as most discernible,
was commonly made use of, from which circumstance the
word took its rise.

CAMISANO, in Geography, a town of Italy, in the
Vicentine, belonging to the State of Venice: 7 miles S.E. of
Vicenza.

CAMISARDS, or Camisars, an appellation given by
the French to the Calvinists of the Cevennes, who formed a
league, and took up arms in their own defence, in the year
1568. In their boldness, crimes, and enthusiasm they re-
sembled the Circumcelliones of Africa. The etymology of
the name is disputed; but it is most probably formed from
camisade. See Camisade.

CAMISENE, in Ancient Geography, a province of Asia,
in Armenia; which had a famous fortress, destroyed before
the time of Strabo. Antonine mentions a village or town
of this name upon the route from Nicopolis to Arabifus. In
the Table of Peutinger it is called Comassa, and placed 23
miles from Sebastia.

CAMISOLE, in Conchology, the name given by Argen-
tives to the Linnean Trachus Phareonis.

CAMITA, or Comita, island, in Geography, lies 3 leagues
N.E. from Cape Rofa, near the N.W. part of the peninsula
of St. Domingo island.

CAMLET. See Camlet.

CAMLETINE, a light flannel, formerly made of hair
and coarse silk, and resembling camisade; but now out of
fashion.

CAMLIN, in Geography, a river of Ireland, in the country
of Longford, on which the town of Longford is seated, and
which falls into the Shannon.

CAMMA, and GORBI, two provinces of Africa, in the
kingdom of Loango, lying between the province of Sette
and the cape of Lobo Gonzales; whose inhabitants are at
perpetual war with each other, and whose country is inter-
sected with lakes and rivers, that afford plenty of fish,
but are infested with sea-horses, which are very mischievous both
on land and water, particularly to the canoes and other ves-
ticles, which are continually plying to and fro upon the rivers
and marshes. The language, manners, and customs of both
these provinces are almost the same with those of Loango.
They both, allow of polygamy, and they are very free in the
dispofal of their wives for the accommodation of their friends
or strangers. Their military weapons are the short pike,
bow and arrows, sword and dagger; and the Europeans
have furnished them with fire-arms, gun-powder and ball,
beside brafs pots and kettles for domestic use, and several
forts of coarse cloths. The chief town of Gobbi lies about
a day's journey from the sea. The land bred's little elfe but
beasts of prey. The principal commerce with the natives,
before the logwood, consists chiefly in elephants' teeth and
tails, the hair of which is highly valued, and used for several
curious purposes.

CAMMA, a river of Africa, which separates the kingdom
of Benin from Loango, and runs into the Atlantic. S. lat.
10° 40'. E. long. 11° 40'.

CAMMANIA, in Ancient Geography, a country of
Greece, which formed a part of Thebrotia. It is the Cef-
trine of Psafianias, and was called Cetlinia, according to
Steph. Byz.

CAMMAS WATER, in Geography, lies at the mouth of
the river running from Morpeth, in Northumberland, and
has a small port for shipping, corn, and grinding flaxen.

CAMMIN, a town of Germany, in Prussian Pomerania,
located near the mouth of the Oder, on the lake of Boden,
about 3 miles from the Baltic, near the fee of a bishop, sup-
plied by the peace of Westphalia, and united to the dom-
inions of Prussia; 35 miles N.E. of Stettin. N. lat.
53° 50'. E. long. 14° 48'.

CAMMIN found, is one of the small channels that lead
from the Baltic into the channel of the river Oder, up to
Stettin.

CAMMOCK, in Botany. See Ononia spinosa.

CAMMONI, in Ancient Geography, a village placed on
the Erythraean sea, in the gulf of Barygaza, according to
the peripius of Arrian; and probably the name with the
Campania of Polyenes.

CAMMOROS, in Botany, a name given by some of the
old writers to a poisonous plant called by the Romans cincuta,
or hemlock; so that it became hence a name for the man-
drake, and some of the nightshades, with some authors.
Many of the moderns, and even some among the ancients,
have erred greatly in confounding the commaros with the
commarea, which is an insect, in figure resembling the root of
this aconite. See Conocladius.

CAMOCLADIA. See Conocladius.

CAMOENA, in Entomology, an African Papillo,
of the Helcœuli tribe, described by Fabricius, the wings of which
are somewhat entire, fuscous, and dotted with black, with
a red band on the posterior pair.

CAMOGENE, in Ancient Mythology, a name given to the
Muses, because it was their principal occupation to cele-
fate in the songs of the gods and heroes. The camome of
Latinum, mentioned by Plutarch in Numis, who were sup-
pused to have flown the sacred fountain to the Veliales,
were probably, says Bryant (Anal. Anc. Mythol. v. I. p. 64.),
the original priapics, whose business it was to fetch water
for initiations from that stream. For Cam-Ain (he says) is the
fountain of the Sun, and the camome were named from their
attendance upon that deity. The hymns in the temples of
this god were sung by these women; and hence the
Camome were made protectors of music.

CAMOGERUM LUCUS, in Ancient Geography, the
name of a wood in the vicinity of Rome, at the Capena gate,
in the midst of which was the fountain of Egeria, consecrated
by Numa. Livy, I. i. c. 21.

CAMOENS, or Lewis de, in Biography, a Portuguese poet,
was defended of an ancient family of Galicia, in Spain, un-
der the name Caaman, but changed to Camoens, in 1370,
when a branch of the family left Spain and attached itself
to the king of Portugal. Camoens, the poet, sprung from a
younger branch of this family, which had been unfortunate;
his father having suffered shipwreck at Goa, with the lots
of his whole property; and was born, as some say, in 1529,
or according to others, in 1526 or 1527; nor is the place of
of his birth left contested than the time of it. Some say,
that he was born at Coimbra, and others, at Santarem; but
Emmanuel de Correa, his intimate friend and companion, says,
that he was born at Lisbon, and that his mother, Anna de
Mundo, was of a noble family. He studied in the Uni-
versity of Coimbra, where he was distinguished by his applica-
tion to the classics and to the philosophy of the times; but
his genius principally inclined him to poetry, and, therefore,
upon his return to Lisbon, he became known at court by
his poetical talents and his gallantry. Being no less agree-
able in his person than in his conversation and writings, he
was betrayed into improprieties of a licentious kind, which
caulmed him to be exiled, as it has been generally thought, to
Santarem and Evoramuris. The place of his imprisonment
and the residence of some of his relations. On this occasion
he compared himself, in one of his elegies, to the banished
Ovid. Distinguished with an inactive life, and being naturally
brave, he obtained permission to serve in a fleet that was sent
to the succour of Conta, in Africa, and in a naval engage-
ment he had the misfortune to lose one of his eyes. His
stay at Lisbon, whither he returned after this naval expedi-
tion, was of short continuance; some new cause of dissatis-
faction arose, and he was again obliged to leave it; and,
therefore, with complaints of the ingratitude of his country,
he resolved to embark for the East Indies in a fleet com-
manded by Cabral, which failed in 1553. At Goa he vo-
unteered his services in an expedition to the coast of Mal-
abar; and after his return, in 1555, he embarked on a second
expedition to the Straits of Mecca, in the Red Sea, where,
the military exertion not being necessary, he employed his time
in writing, and in visiting some of the adjacent parts of
Africa, which he has beautifully described. Having spent
the winter at Ormus, he returned to Goa; but indulging
his disposition in composing some satirical pieces against
Bareto, the Portuguese viceroy of India, and several other
principal persons of Goa, he was banished by order of the
viceroy to Macao in China. Here he obtained the profit-
able office of commissary of the estates of the decedent, and
in the exercise of it acquired some property. During a re-
fidence of five years at Macao, he finished his "Lusiad,"
which he had begun some years before in Portugal. Upon
the removal of Bareto, he determined to return to Goa, and
having freighted a ship for this purpose, he was unfortunately
shipwrecked at the mouth of the river Meco, on the coast
of Cambaja, and lost his whole property; however, he saved
his life, and his poems, which he bore through the waves
in one hand, whilst he swam ashore with the other. The
natives treated him with hospitality; and on this remote
coast he wrote his beautiful paraphrase on the 157th Psalm,
which represents the Jews as hanging their harps on the
willows by the rivers of Babylon. Upon his arrival at Goa,
he was kindly received by Don Constan
tine de Braganza,
the new governor; but his successor, count Redondo,
conceiving prejudices against him, on account of some malfac-
tion in his office at Macao, with which he was charged by his
enemies, threw him into prison. Having cleared himself
of the charge alleged against him, he was detained for
debt; and it was in consequence of an honorable petition,
which he presented to the viceroy, that he obtained his
liberty. His next adventure was that of accompanying the
governor of Sofala to that settlement; but he was deceived
by promises which were never fulfilled, and treated with
tingular severity. When the governor found that Camoens
was determined to leave him, he endeavoured to detain him
by making a charge of debt for his board, and threatening
to confine him in prison. These unreasonable claims were
satisfied by some Portuguese gentlemen, who invited him to
accompany them to Europe; and accordingly he arrived
with them in Lisbon in 1569, after an absence of 16 years.
One principal object, which made him decease of revisiting
his native country, was the publication of his "Lusiad,"
which appeared in 1572. This poem, which came to a second
edition in the same year, was dedicated to king Sebastian,
who, it is said, allowed him a small pittance of 4,000 rials, on
condition of his living at Coimbra. With this promise, if it
had been continued, Camoens would have lived in peace and
comfort; but Sebastian found his life in Africa, and upon
the accession of Henry, the poet was forgotten, and his poe-
ty was withheld. Thus reduced to a state of deplorable
indigence and distress, poet, who had produced what at
its first appearance was thought to do honour to the nation,
spent the residue of his life, humbled and mortif'ed amongst
a few Dominican monks, either in an almshouse, or under
the charitable roof of a nunnery. It is said, that his black
servant, a native of Java, who had been his companion
for many years, and who assisted in saving his life when he
was shipwrecked, begged in the streets of Lisbon for the
support of his master, who died in 1579. It is said, that
his death was accelerated by the anguish with which he fore-
saw the ruin impending over his country. In one of his
letters he utters these remarkable expressions: "I am ending
the course of my life; the world will witness how I have
loved my country. I have returned not only to die in her
boim, but to die with her." He was buried as obliquely
as he had closed his life, in St. Anne's church; and the fol-
lowing epitaph was inscribed over his grave:

"Here lies Lewis de Camoens,
Prince of the poets of his time.
He lived poor and miserable, and died such,
Anna Domini, 1579."

Some years afterwards a respectable monument was erected
over his remains, at the expense of a Portuguese nobleman.
"His memory was honoured by numerous eulogies from the
poets of Spain and Portugal, and the name of Camoens is
still pronounced with enthusiastic veneration by all the va-
tories of Portuguese literature." Of the various poetical
compositions, written by Camoens, the epic poem, entitled
"Lusiad," is the only one which makes him known in modern
times. The subject of this poem is the discovery of the East
Indies by the Portuguese, under Vafco de Gama; and the
fleet is conducted by the poet round the coast of Africa to
Calicut, on the Malabar coast. In the course of the voyage
the author introduces a great variety of descriptions, which
with his knowledge of the parts of the world to which they
relate renders noble and interesting. Some of his poetical
fictions are conceived with true genius; and the giant: Adamador,
the guardian of the Cape of Tempele (since called the Cape
of Good Hope,) is a creature of fancy as sublime as the
imagination of a poet has produced. "On the whole,"
says Dr. Alkin (Gen. Biog.), "the want of a well-connected
plan, the neglect of proper decorum, the monstrous mixture
of the Heathen with the Christian mythology, and the
general baldness and want of elevation in the style, place
this work far beneath the principal epics of ancient and
modern times." "The whole work," says Dr. Blair (Lec-
tures on Rhetoric, &c. vol. iii. p. 273.), "is conducted ac-
cording to the epic plan. Both the subject and the incidents
are magnificent; and, joined with some wildness and irregu-
larity, there appear in the execution much poetic spirit,
strong fancy, and bold description." "There is no attempt
towards painting characters in the poem; Vafco is the hero,
and the only personage indeed that makes any figure. The
machinery of the Lusiad is perfectly extravagant; not only
is it formed of a popular mixture of Christian ideas, and
Pagans; but so conducted that the Pagan
people appear to be the true Deities, and Christ and the
Blissed Virgin to be subordinate agents. One great feature
of the Portuguese expedition, our author informs us, is to
propagate the Christian faith, and to extirpate Mahometan-
ism. In this religious undertaking, the great protector of
the Portuguese is Venus, and their great adversary is Bac-
rus, whose displeasure is excited, by Vaux's attempting
to rival his fame in the Indies. Councils of the gods are held,
in which Jupiter is introduced, as foretelling the downfall of
Mahometanism, and the propagation of the Gospel. Vaux,
in great distress from a storm, prays most fervently to God;
implores the aid of Christ and the Virgin, and begs for such
assistance as was given to the Irooites, when they were
passing through the Red Sea, and to the Apostle Paul, when
he was in hazard of shipwreck. In return to this prayer,
Venus appears, who differing the storm to be the work of
Bacchus, complains to Jupiter, and procures the winds to
be calmed. Such strange and preposterous machinery shows,
how much authors have been misled by the absurd opinion,
that there could be no epic poetry without the gods of
Homer. Towards the end of the work, indeed, the author
gives us an awkward salvo for his whole mythology; making
the gods Tellus inform Vaux, that she, and the rest of the
Heathen deities, are no more than names to describe the
operations of Providence.

"There is, however, some fine machinery, of a different
kind, in the Lusitania. The genius of the river Ganges, ap-
ppearing to Emanuel king of Portugal, in a dream, inviting
that prince to discover his secret springs, and acquainting him,
that he was the destined monarch for whom the treasures of
the East were referred, is a happy idea. But the noblest
conception of this fort, is in the fifth canto, where Vaux is
recounting to the king of Melida, all the wonders which he
met with in his navigation. He tells him, that when the
fleet arrived at the Cape of Good Hope, which never before
had been doubled by any navigator, there appeared to them
on a sudden, a huge and monstrous phantom rising out of
the sea, in the midst of temples and thunders, with a head that
reached the clouds, and a countenance that filled them
with terror. This was the genius, or guardian, of that
hitherto unknown ocean. It spoke to them with a voice
like thunder; menaced them for invading those seas which he
had so long postponed undisturbed; and for daring to ex-
amine the secrets of the deep, which never had been reveal-
ed to the eye of mortals; required them to proceed no fur-
ther; if they should proceed, foretold all the destructive epi-
calms, that were to befall them; and then, with a mighty
voice, disappeared. This is one of the most solemn and strik-
ing pieces of machinery that ever was employed; and is
sufficient to show that Canoens is a poet, though of an irre-
gular, yet of a bold and lofty imagination."

This poem has been translated into many languages, and
illustrated by elaborate commentaries. Two English
versions of it have appeared; one by R. Richard Fawke, in
the 17th century; and another in the latter part of the 18th
by William Julius Mickle, A.D. 1776, 410. "This last,"
says Akin, "is one of the best verified poems in the Eng-
lish language; but the liberties taken with the original, in
large additions, alterations, and omissions, bespeaks a per-
fect superiority of poetic language, render it a very flat-
Intro. to Mickle's Lusitania.

Camoens's Cave, in Geography, a cave below the loftiest
eminence in the town of Macao in China, so called from a
tradition current in the settlements, that the Portuguese post
of that name wrote his celebrated poem of Lusitania on that
spot. This interesting cave is in the middle of a garden,
which commands a very extensive prospect.

Camoili, a town of France, in the department of
Marbilaian, and district of Vannes, 14 league W.S.W. of
Roche-Bernard.

Caminile, in Botany. See Anthems.

Camoou, in Geography, a town of Japan, in the
province of Omi.

Cama. See Zamora.

Camaorta, a small island in the bay of Bengal. N.
l. 8° 8'. E. long. 94° 5'.

Camotes, a group of islands belonging to the Phi-
lippines, in the East Indian ocean, situate between Zebu or
Cebu, and the coast of Ogmush and Leyte; the chief of
which is Poro, dependent on Zebu.

Camoücle, in Orinology, the horned ferreer, ac-
Garding to Bajou. See Palmæda coruna.

Camoeflet, a smoky paper held under the nose of
one that sleeps. But when this word is made use of as a
term of war, it signifies an affront, a mortification, a disap-
poiniment. An enemy's miner is paid to give a camouflet
to ours, when he finds means to defend or get down into his
adversary's gallery, to make some small mines blow up, and
thereby to ruin or facilitate him.

Camp, in Geography, a town of Germany, in the circle
of the Lower Rhine, and archbishopric of Treves, on the east
side of the Rhine, opposite to Boppard.

Camp, in the Military Art, the ground where a corpo-
s, body of troops, or army, pitch their tents, and live or dwell
in the same, either for a shorter or longer space of time.
In a more general acceptation of the word, it may be defined to
be the spot or ground where any number of persons, how-
ever small, sleep or remain in tents, wigwams, huts, or other-
wise, for one night or a longer time, whether they be in a
state of warfare, or engaged in their ordinary pursuits of
life. Thus, for instance, the savages or wandering natives of
America are said to encamp; and the spots where they have their
wigwams, or remain even for one night or two, are
called their camps or encampments. Many of them are in
as simple and uncultivated a state of life as it is possible for
human creatures to be in. For men neither ever did nor
ever can exist but in a state of society of some kind or other.
Ever since there have been men, however, there have been
disputes or quarrels. These led to violence and warfare, and
obliged those who lived even in the simplest and rudest state
of society, to think of and contrive means for securing their
encampments against surprise or insults. For this purpose
they would naturally make use of flaks, huts, abatis, a
ditch, and occupy situations difficult of access, and advan-
tageous in other respects. The first contrivances and efforts
of genius, however, in the way of defence must have been
 rude, defective, and of little moment, suited to the simplicity
of those by whom they were made, who possessed neither the
experience that could lead to the conception of great de-
rive, nor the means necessary for executing them. Ditches, bor-
dered with brush, bushes, or abatis, or a single row of flaks,
surrounded their huts, tents, or cabins, and formed their
whole security. The Indians in America furnish, at this mo-
time, many examples of this manner of fortifying. As men
advanced in social improvements, and began to have fixed
or permanent habitations, they would naturally think of con-
structing walls with wood, earth, and afterwards with stones.
Julius Cesar in his time found wooden walls in use among
the Gauls; and there are some parts now in Ruffia, where
the
CAMP.

The towns are defended or secured by walls of wood or timber.

The words made use of by the Grecian writers to express a camp, or the camp, are always in the singular number, as το καστρον, το ιβυκτρον. But the Roman military writers constantly use the word castrum, in the plural number, to signify a camp, or the camp. Some have attempted to derive the word castrum from castra, making it of the same import as castra, quod ibi castrarum libro, and because the Roman folders were not originally permitted to marry. But the word castra is the plural of castrum, which Cicero has made use of: and castrum or castra is easily and evidently derivable from castus or castrum, to erect, or build huts or tents adjoining to one another or close together. But no good or even plausible explanation has been given of the cause or reason why the Roman historians invariably employ the word castrum in the plural number, and not castrum in the singular, not only when they mention both the confin camps when separate, but also when they speak only of one of them or of both joined together as one. The following circumstances, however, probably gave rise to that practice, or customary mode of expression, for a camp or the camp. The tribes originally when they went out encamped separately and apart from one another, each by itself. The different positions or spots of ground they occupied, were naturally called the camps, or castra; which term or expression growing into use was retained when they were encamped together and surrounded by one and the same ditch and rampart.

It is not probable that either the Romans or any other people originally enclosed their camps on every occasion with regular ditches and ramparts, but rather that they frequently chose strong and advantageous situations, and depended on watchfulness and valour for their security. It was a very ancient custom, however, among the Greeks, to surround their places of encampment occasionally with a ditch or trench, which they called ερυθας. Homer speaks of the camp which they formed before Troy, and makes them poll the bell and bravel of their troops on the two flanks or wings. The Macedonians, who were trained up in martial exercises from the time they were seven years of age, and studied war as an art or science more than any other of the states of Greece, were not only well acquainted with the genuine maxims and principles of warfare, but also skilful, dexterous, and expert in all the methods of carrying them into practice long before the Macedonians, the Carthaginians, and the Romans. They also received from their celebrated lawgiver, Lycurgus, the first mixed form of government composed of the three simple ones, viz. monarchy, aristocracy, and democracy, that existed in Europe. It failed for many ages; and whilst they adhered to his laws and institutions, they were alike free from internal dissensions among themselves, and proof against subjugation by external force. The Macedonians borrowed from them the belt part of their military regulations and discipline. The Carthaginians imitated them, and on one occasion a certain Lacedemonian, named Xantippus, who joined them with a body of mercenaries from Greece, by his superior skill in the art of war, and dexterous management, defeated the Roman confed Regulus, who till then had been uniformly victorious over them, and saved their fleet when it was brought to the very brink of destruction. The Romans, at an early period, not only adopted several of their military maxims, precepts, and institutions, but also committed them to writing, carefully keeping records of them, and retained them ever after. It has been affirmed on the authority of some writers, that their camp was of a circular form, which was prescribed by Lycurgus, as better for defence than any other. This reason, however, is not an accurate or just one. For a direct defence from a straight line is much better than from the convexity either of a circle or ellipse. Before this, the observation militates against facts, and the practice of the Lacedemonians themselves in the different wars in which they were engaged. For, like the rest of the Greeks, they did not observe any invariable form or method in their encampments, but chiefly consulted the nature and strength of the ground they encamped on, and gave to their camp the form and arrangement that best suited the same, employing, on different occasions, every sort of figure which the positions they occupied required. This erroneous idea, in regard to the figure of the Spartan camp, was probably derived from the circumstances, that the city of Sparta itself was of a regular form. It is not very probable, however, that the Spartans often intrenched their camps, as they did not even secure their city with a wall, or rampart, depending on their own vigour and valour, more than on walls, for its protection. That they sometimes did, however, cannot be denied. For Cleomenes, when opposed to Antigonus, not only occupied strong positions, but also made use of intrenchments, and even abatis. Many other influences might likewise be mentioned. We know, indeed, from the best authority, that the Greeks in general accommodated the figures and distributions of their camps to the situations they encamped on, sometimes securing them with trenches and ramparts, but often not. They occasionally suffered severely by neglecting this precaution, of which the Meffennians furnish a striking example, when they marched with their forces to join Philip of Macedon, though they encamped close under the walls of a friendly fortress. Polybius, in the sixth book of his general history, in speaking of the great regularity of a Roman camp, the rules the Romans regularly observed in forming it, their invariable custom of surrounding it with a ditch and rampart, and the great care and facility with which those were made, by each soldier’s knowing always on what part he was to perform his labour, as well as his own place in the camp, and that of the body he belonged to, contains their practice with that of the Greeks; and tells us, that the, when they encamped, chiefly considered the natural strength of the place they were on, and the arrangement and disposition of their encampment, with the party to avoid the labour of making intrenchments, and partly persuaded that which nature did by art are seldom so strong or secure as those that are formed by nature. He says, that in compliance, therefore, with what the situations demanded, they were not only obliged to give every sort of figure to their camps, but also to vary the position of the several parts of them, as the place for each was favourable or improper; and that from thence it happened that the soldier never knew to a certainty his own place in the camp, or that of the body to which he belonged. But the Romans, he informs us, willingly submitted to the talk of making intrenchments, and to other toilsome labour, for the sake of the great advantage that was found to arise from their employing a method that was never changed, and which rendered all the parts of the camp quite familiar to the army. The Macedonians, who learnt the art of war from the Greeks, and particularly from the Spartans, like them gave their camp every sort of figure to make it fit the ground they encamped on, sometimes intrenching it, and sometimes not, as circumstances seemed to require.

Even before Alexander the Great invaded Persia, the Grecian colonists in Asia and the nations in it who were in the practice of employing Greeks in their armies, encamped nearly in the same way, varying the forms of their encampments with those of the particulars they occupied with them,
securing them with intrenchments on some occasions, and on others not. But after the death of that prince, who seemed to have been born for the conquest of men, both the Egyptians and all those nations of Asia that had been visited by his arms, followed very nearly the Macedonian or Greco-

median method of encamping, and generally when at no great distance from their enemies, or in danger of being attacked, strengthened and secured their camps with ditches and ramparts. Thus the camp of Molon, who was governor of Media, and had revolted against Antiochus, the son of Seleucus, was intrenched on the bank of the Tigris. Thence the 'Eilamite, governor of Cilicia-Syria, secured the troops he had posted in the narrow part of the vale of Mar-

fya, between the fortresses of Brouchi and Gerasa, so well with intrenchments and palisades, that the said Antiochus in trying to penetrate that way, fulfilled his great aloft, that he was obliged to desist from the attempt. Both this king and Polybius, in their comment on the sovereignty of that province, intrenched their camps. And many other instances of this practice, subsequent to the time of Alexan-

der, might be given.

The Carthaginians, who had an intercourse with the Greeks, long before their obilinite contention with the Romans in Sicily for the possession of that island, followed a similar mode of encamping, changing, like them, the forms of their camps, to make them suit the situations they occupied, surrounding them sometimes with ditches and ramparts, and sometimes not, as circumstances made such precautions necessary or otherwise. It is probable they paid more attention than formerly both to the security of their camps, and to regularity in forming them after they came to be engaged in long and obstinate conflicts with the Romans. It does not appear, however, that the Carthaginian generals, when they sat down, contrary both to common sense and the rules of military science, with their elephants and cavalry, as well as their infantry, on a rough and craggy eminence near Adis, which Regulus was besieging, took measures for strengthening their camp with any works whatever. But it is evi-
dent that the camp of Xanthippus, who soon afterwards de-
feated Regulus, and destroyed his army, was intrenched as well as that of the Romans. There never perhaps existed a general who was more capable than Amilcar Barcas, of choosing proper and advantageous ground for encampments, or who knew better how to secure and defend them. His son Annibal, who, though he often surprised his enemies, was himself never once surprised, always secured his camp so well with an intrenchment and palisades, that during the sixteen years he waged war against the Romans in Italy, though he never once dismmissed his army from the field, no serious attack was ever made on it but on one occasion by Manuis, when most of his troops were out of it a-fugiting. As he very judiciously adopted the arms and armour of the Romans for his heavy-armed infantry, after the first battle he fought with them, it is more than probable that he also followed their mode of encamping, in which they appear to have been as superior to any other people among the ancients, as they were in their arms and order of battle. And as some part of their method is still retained by all nations in Europe in encamping their troops, it may not be improper or unnece-
fary to give a correct plan and description of a Roman camp, and of the disposition or arrangement of its different parts from Polybius, a faithful and judicious historian, and the only one among the ancients who has left us a distinct account thereof. Before his strict adherence to truth in all his nar-

ratives, he was a person of great political and military talents, wrote at a period of time when the government of Rome was in its greatest vigour, and possessed a thorough knowledge of all its component parts, customs, and institutions. This is perhaps the more requisite, as Julius Lipsius, who was a man of much learning, but of little military information, has led almost every modern writer wrong, that has treated either on the castramentation or order of battle of the Romans.

Though it is highly probable that from the very begin-
ing they secured their camps more or less with intrench-
ments, and particularly from the time they began to carry on their operations at some distance from their own city, and the tribes came to encamp together on the same spot, or nation with, and the same enclosures, yet if we are to credit some historians, there was but little interior security or or-
derly arrangement of the different parts in them, before the 124th Olympiad, when Pyrrhus, king of Epirus, on the initi-
atum, and in support of the Tarentines, invaded Italy. That prince was certainly endowed both with military talents of an extraordinary nature, and with the most undaunted courage; nimbles in stratagems and expedients, most skilful in every branch of discipline, and perfectly conversant in all parts of the art of war. He waged war with various fleets, with most powerful kings, and great commanders, and gene-

rally was victorious without being ever, strictly speaking, vanquished himself. In all his battles with the Romans he employed not only the arms but the troops of Italy, and placed, in alternate order, companies of them, and cohorts armed and drawn up after the manner of the phalans. Even with this contrivance, however, though he rather wanted them in some engagements, he never was able to obtain any very clear or decided advantage over them; such were the in-
herent excellence of their order of battle, and the advan-
tageous nature of their arms and armour in close combat. By their former and steady perseverance, they at last forced him to quit Italy, and leave the Tarentines with the inhabi-
tants of other cities, that had been confederated with him against them, to their fate. And getting possession of one of his camps, they, from the interior arrangement of it, im-
proved the disposition of their own, and gradually brought their castramentation to perfection.

The Romans were the only people we have any account of, who invariably observed one mode or manner of encamping, and confidently intrenched themselves wherever they encamped, if they halted only for a single night.

The intrenchments, however, with which they surrounded their temporary or large camps in the field were not so strong as those which they made round their castra flavia, their forts or smaller camps, called castra, in which a few cohorts or small garrisons were frequently left for some time to defend them-

selves, without any other aid or assistance, and which were sometimes enclosed with two, three, four, and even five or more distinct ditches and ramparts.

They had their castra efliva, and their castra hiberna. The first of these they occupied in summer, when they were carrying on their operations in the field; and the last in either towns they took possession of, or such as they raised themselves in proper situations, and fortified for the purpose of quartering their troops in during winter. Their castra effiva were likewise of two forts, namely, those which they occupied from day to day, or for a short time only, being temporary camps, and called simply castra, and those they occupied for a considerable space of time, and which are re-

peatedly called castra flavia. The former of these were more slightly intrenched than the latter.

"This then," says Polybius, book vi. "is their (the Roman) kind of castramentation."

Ground being always chosen for the encampment, the gen-

eral's tent occupies the part of it most convenient for pro-

spect and command. A standard being placed where they are
Next to the principals, and behind them, they, in like manner, encamp the hallats looking in contrary way, placing the figures close together. And this is the manner in which, in each of the parts, (of a legion) according to the decision from the beginning, it happens, that all the soldiers are equal both as to length, and as to their terminating evenly towards the side of the intrenchment at the front, turned towards which they encamp the hallats. See No. 12.

Again, leaving fifty feet from the hallats, they encamp opposite to them the horse of the allies, beginning at the same right line with them, and ending at the same right line. But, as I have observed above, the number of the foot of the allies is equal to that of the Roman legion, as is shewn by that of the extraordinary. And that of their horse is double. A third part being taken from these for extraordinary, by increasing in proportion the depth of the figures, in which they encamp them, they endeavour to make them equal, as to length, the Roman legions. See No. 13.

All the five figures being now completed, they again, increasing the depth in the same proportion, place the maniples of the allied foot ranging ten to rear to the horse, and looking towards the intrenchment, and both fronts of its transverse fides. And in each example the centurions occupy the fifth fides on either side. See No. 15.

But in following the above-mentioned method of encamping, they separate each fide the fifth troop into five feet from the fifth, and in a similar manner, the maniples of foot; so that this becomes another opening through the middle of the legions, running these fides, and parallel to the tents of the tribunes, which they call the fifth; (or via quintana), from its extending along the fifth maniples. See No. 16.

But the place behind and front from the tents of the tribunes, lying adjacent to each fide of the general’s ground, becomes one part of it a place for the forum, and the other for the quaflor, and the things under his charge. See No. 17, and 18.

From the fmall tents of the tribunes, on either fide, having an arrangement as it were reflected backwards perpendicularly to these tents, all the choice men of the extraordinary horse, and some of those serving as volunteers, from regard and respect to the confuls, encamp according to (or parallel to) the fides of the intrenchment on the transverse fides, part of them fronting the fides of the quaflor, and part of them on the opposite fide looking into the forum. And it for the most part happens to these not only to encamp near the confuls, but also on marches, and on other necessary occasions, to perform their whole duty and service about the confuls and quaflor. See No. 19.

And the foot performing a similar service with the forementioned horse, are placed opposite to them, looking towards the intrenchment. See No. 20.

Then from these is left a ftree one hundred feet wide, and parallel to the tents of the tribunes extending along the opposite fides of the forum, praetorium, and quaflorium, to the above-mentioned parts of the intrenchment. See No. 21.

And along the upper fide of this, the extraordinary horse of the allies encamp, looking towards the forum together with the praetorium, (or general’s ground), and the quaflorium. See No. 22.

At the middle of the encampment of these horse, and at the fame ground adjoining the praetorium, a ftree of fifty feet is left reaching to the rear fide of the encampment, its direction lying at right angles to the aforesaid broad ftree. See No. 23.

With their backs to these horse again, the extraordinary foot of the allies are placed looking towards the intrenchment and the rear aspex of the whole encampment. See No. 24.

And the vacant space left on each fide of these towards the transverse fides, is given to strangers and allies occasionally arriving. See No. 25.
C A M P.

All being thus disposed, the whole figure of the encampment becomes an equilateral quadrangle. And as to what relates to the intersection of the streets in it, and its distribution in other respects, it has an arrangement resembling a city. They place the intrenchment on every side two hundred feet distant from the tents; and this vacant space affords them many and great conveniences. It is commodious and useful for the ingrats and egrets of the legions. For each of them move out into this open space through their own streets, but do not push down and trample on one another by crowding into one. Carrying also to this place the booty of cattle they bring in, and the spoils they take from the enemy, they keep them safe during the nights. But the greatest is this, that in nocturnal assaults neither fire nor weapons, except a very few, can reach them. And it happens, that even these are almost harmless, from the greatness of the distance, and the surrounding tents.

Polybius, in this description of a Roman camp, supposes a legion to consist of four thousand two hundred foot, and three hundred horse. He observes, however, that, from it, those who choose to examine it will easily be able to understand the extent and whole perimeter of a camp, even when the legion consists of a greater or less number. When more of the allies than are usual either accompanied them from the beginning of an expedition, or afterwards arrived in the camp, he informs us, that besides assigning to the latter the places already mentioned, they filled them with, also, those on each side of the pretorium, bringing the forum and quæstrorium together into one place, as the occasion and necessity required; and that as to the former, when their number exceeded what was customary, besides the locations usually made for them, they laid out an additional street for them beyond the legions both on the right and left side of the camp.

But when the four legions and both confuls were assembled together within one and the same intrenchment, he says, that nothing more is necessary for understanding their method of encamping than to suppose two armies disposed of in the manner now described, with their ears where the extraordinary, as he has mentioned of each were placed, joined together. Whenever this happened, he tells us, the figure of the camp, instead of being a square, became a rectangle, having its area double that of the confuslar camp he has given a description of, and its perimeter one half greater. This, indeed, is manifest, since two equal squares joined together form a rectangle, of which the area is double that of either, and the perimeter is to that of each of them, in the ratio of 6 to 4 or of 3 to 2. The Romans, he adds, always observed this method or disposition as often as both confuls had their camps joined together, and that as often as they had separate and distinct camps, the arrangement continued the same, with this variation only, that they then placed the forum, quæstrorium, and pretorium, in the middle between both the armies.

Polybius, in describing the Roman method of encamping, makes no mention of the velites, or light-armed troops, who, in every legion, were equal in number to the hastati, or to the principes. But in giving an account of the composition of the legion, and the mode of forming it, he expressly affirms, that they were distributed equally, or in just proportion, among all the rest, according to their number. It is, therefore, natural to suppose, that the same distribution of them existed in the camp, or that two-fifths of them encamped with the hastati, two-fifths with the principes, and one-fifth with the triarii.

From what has been observed, then, it appears that the Romans in the time of Polybius, allowed ground for encamping on at the rate of 39.44 square feet to every foot soldier, and 33.33, for every horseman and trooper and his horse. For as the hastati and principes were equal in number in every legion, and the velites equal to each of them, and as each of the former consisted of ten companies, measuring, when the establishment of the legion was at 4200 feet, to 1200, and had two-fifths of this number, or 480 of the velites distributed among them, it is evident, that on every foot of ground 100 feet square, occupied by a maniple either of hastati or of the principes, there were encamped 120 of themselves, and two-fifths of this number, or 48 of the velites, in all 168 men. But a square, of which the side is equal to 100 feet, contains 10,000 square feet, which divided by 168, gives 59 square feet, and eleven-twenty-one parts of a square foot. In like manner, as the number of the triarii was only equal to half that of either the hastati or the principes, amounting to no more than 600 men, and as these were also divided into ten companies, and had one-fifth or 240 of the velites distributed among them, it is manifest, that on each of the ten rectangles, occupied by their maniples, there were encamped 60 of themselves, and 24 of the velites, or 84 men. But a rectangle 100 feet long and 70 feet broad, contains 7000 square feet, which divided by 84 gives likewise 85 square feet and eleven-twenty one parts of a square foot.

We arrive at the same conclusion by dividing the number of square feet contained in the whole ground alligned by Polybius for encamping all the foot of a legion, by 4200, the number of them. For the hastati and principes encamped on 20 equal squares, of which each contained 10,000 square feet, having its side equal to one hundred feet. The whole 20 then, of course, contained 200,000 square feet. If to this number of square feet there be added the contents of the ten equal rectangles of 5000 square feet each, that were occupied by the ten maniples of triarii and their proportion of velites, or 50,000 square feet, we get 250,000 square feet for the surface of the whole ground, that the infantry of one legion encamped on, which number of square feet divided by 4200 give 59 square feet, and eleven-twenty-one parts of a square foot as before.

And as there were 300 horse then in each legion, who were also divided into ten parts or troops, and encamped on ten equal squares of 10,000 square feet each, it is no less evident that the encamping ground allowed for them was at the rate of 333 square feet, and one third part of a square foot for each horseman or trooper and his horse, since 10,000 divided by 30, or 100,000 divided by 300, give, 333 and one third.

Polybius also informs us that the excavation of the ditch and the raising of the rampart along the two transverse sides of the intrenchment, or those near the wings of the allies, were done by them, and that the other two sides were left to the Romans, to each legion one; that each side was divided into as many parts or portions as there were maniples to labour on it, and a centurion appointed to superintend the execution of the work in each part, and that the whole side was inspected and approved of by two of the tribunes, whose turn of duty it was to attend to every kind of necessary service in and about the camp. For the tribunes, two by two in rotation, took upon them not only the care of the camp, but the management and direction of everything done in it for two months at a time.

As in encamping, a place was fixed for the confuls's or general's tent before ground was laid out for any others, or on breaking up the camp, his tent and those of the tribunes were
were always first taken down. And when they were all struck, the baggage collected and placed on the beafts of burthen, the whole camp on a signal made began to move, with the extraordinaries usually in the van, and next to them the allies of the right wing, followed by the baggage of both. Next to them marched the fift of the Roman legions with its baggage behind it; then followed the femed legion, having behind it not only its own baggage, but also that of the allies of the left wing, who closed the rear of the whole march.

Polybius in his description of a confular camp has not given us any dimensions for the rampart and the ditch. These must have varied with circumstances and situations, and particularly with the length of time for which it was intended to be occupied. Julius Caesar in the second book of his war in Gaul, chap. v. informs us that he ordered one of his camps to be fenced with a rampart 12 feet high, and a ditch 18 feet deep.

In describing the Roman camp, Polybius does not give us either the names or number of the gates. He only informs us, that the exterior sides of the camp were guarded at night by the velites, who placed ten of their number at every gate, and kept watch all in the day-time throughout the whole extent of the intrenchment. It is well understood, however, from the information left us by other historians, that there were four principal gates, viz. one in the middle of the front of the intrenchment opposite to the termination of the front of fifty feet wide between the cavalry of the Roman legions, another directly opposite to it in the middle of the rear of the intrenchment, and two directly opposite to each other, and to the ends of the front of 100 feet wide between the tents of the tribunes and the Roman legions in the tranverse side of the intrenchment. One of the two last mentioned, which was on the right hand side of the camp, was called porta principalis dextra, and the other on the left hand side, porta principalis sinistra. The other two principal gates, namely the two first mentioned, were called porta praetoria and porta decumana. But in regard to their real or actual situations, though all writers on the subject allow them to have been opposite to each other, doubts and different opinions have arisen, some placing the decuman gate in the front side of the intrenchment and others in the rear. Those, who contend for its having been placed in the middle of the rear side of the intrenchment, make it derive its name from this circumstance, that such of the soldiers, as had been found guilty of neglect of duty or delinquency, were conducted through it to the place appointed for their punishment or execution, and refer to the following words of Vegetius, book i. chap. 23, "Porta autem, qua appellatur praetoria, aut orientem spectacere debet, aut illum locum, qui hostes replevit; aut fit iter agitur, illam patrem debet attendere, ad quam eft profectum exercitus, intra quam prince centurii, loc efl, cohortes paulatim tendunt, et dracones et figura conftituent. Decuman autem porta, qua appellatur, po if praetorii efl, per quam delinquentes milites educuntur ad pecuniam."

The late major general Roy referring to this passage expresses himself in these words, "With regard to the decuman gate mentioned in this passage of Vegetius, it is to be observed, that for the maintenance of that rigorous discipline established in the Roman armies, when a particular corps or any number of soldiers had misbehaved in the field, or had been mutinous to their officers, it became necessary to debar the delinquents, every tenth man being drawn out by lot and doomed to suffer death. Hence we may judge, that the decuman gate had its name from thofe, who had received sentence, being led out by it for punishment or execution." Military Antiquities of the Romans in Britain, page 50.

It does not follow, however, from the foregoing words of Vegetius, that delinquents were led out through the gate in the rear of the camp to receive punishment. It may well as well be inferred from them that they were carried out through the gate in the front of the camp. And from his observing that the praetorian gate ought to look either to wards the camp or the enemy, we cannot at all ascertain whether it was customary for the Romans to make the front or rear of their camp look towards the east. But this inference may reasonably enough be drawn from them that the praetorian gate sometimes looked towards the enemy and sometimes not. Polybius, without making the four different aspects of his confular camp have any reference whatsoever to the east, well, north, and south, expressly supposes the front of it to look towards those parts, that were most convenient for supplies of water and forage. If any one of the principal gates in his time went by the name of porta decumana, it was probably so called from the decumans maniple, and decumane turma next to the front of the intrenchment. That it took its name from soldiers selected by decimation for punishment, being led through it out of the camp, is a supposition directly contrary to his authority; for he informs us, when speaking of that punishment and the rigour of the Roman discipline, that it was actually inflicted within the camp.

Lipius, whom most of the modern writers on the Roman claimatuation as delivered by Polybius have followed, though a man of great learning, de parts from some of the rules laid down by that historian. He leaves out the space fifty feet wide between the ground, that was occupied by the tents of the tribunes, and the forum, praetorium, and quaedrorum, which Polybius expressly assigns for their horses, beafts of burthen, and other equipages, in these words, "et alibi paratam fumptum ex diuersis aliis publicis, quae in templo fuerint, promittatur." Now that their tents were not only in front of this space, but also at some little distance from it, is evident from another passage in this history, where he informs us, that three companies were allotted to each tribune, who, among other services they performed for him, furnished him always with a double guard, consisting of four soldiers, two of whom were stationed before his tent, and the other two behind it near to the horses.

He allows, however, 50 feet in depth as we have done, for the tribunes' quarters; and this depth does not appear to be more than what was necessary for them, exclusive of the 50 feet allowed for their horses, beafts of burthen, &c. as they were the officers next in rank and dignity to the conful and quaeftor, had, two by two in succession, charge of the whole camp, and the superintendence of every thing done in it, and had also all delinquents brought before them to be tried and to receive sentence. Although he leaves out the aforefaid width of 50 feet left for the horses, &c. of the tribunes, he quarters among the guards a number of volunteers, to greatly exceeding that which usually attended one confal, with two legions and the ordinary complement of allies, that he makes his camp 53 feet longer from front to rear than it is broad, contrary to the rule for keeping it always an equilateral quadrangle. In this particular, then, he departs not less than 83 feet from the rules laid down by Polybius, and makes the ground for quartering or encamping the extraordinarii in the rear deeper by the same number of feet than by these rules it could be

Instead of making the quarters of the guards for the conful and quaeftor commence, according to Polybius, from the
lent tents of the tribunes, or from the quaestorium and forum, which extended on the right and left of the praetorium towards the transept files of the camp as far as the encamping ground of the tribunes, and that of the Roman legions did, he makes them begin 20 feet distant from the same.

Though Polybius neither mentions the praefecti of the allies, nor assigns any encamping ground for them, it is natural to suppose, that their quarters, like those of the tribunes, extended the whole breadth of their own horse and foot, and no farther, leaving a passage 50 feet wide between the left tent of the tribunes and the first of theirs, both on the right and left, which passages must have been very convenient as communications with the principia for the horse guards, who fronted the forum and quaestorium. Liphus, however, makes the tents of the praefecti extend 20 feet into each of these openings, beyond the encamping ground of their own troops.

He also takes up ground for the quaestor and two legati exclusive of that for the public, which he has no authority for, and Polybius, who makes no mention at all in his account of the Roman castration of a legatus or legati.

As to the duke of Rohan's plan of a Roman camp, he leaves out with Liphus the space across it 50 feet wide, expressly allowed by Polybius for the horses, beafts of burden, baggage, &c. of the tribunes. He makes the ground for quartering the super numeraries, stragglers, and part of the extraordinary, too deep by 50 feet, which additional depth being equal to the width of the said space left out behind the tribunes' tents, causes his plan to be a square, though in his distribution of these quarters, he entirely mistakes that historian's meaning. He also lays out the quaestorium in various whimsical divisions without the least shadow of authority from that writer.

Sir Henry Saville, in his view of the military affairs of the Romans, gives a description of their camp on, which he makes a square or equilateral quadrangle, but 32 feet broader and deeper than it ought to be, by allowing the horse of the allies 16 feet more depth on each side than their jall proportion. He, in like manner, leaves the space 50 feet wide allowed to the tribunes for their horse, beafts of burden, and baggage; but makes the encamping ground for the extraordinary that remain after those allotted for the guards are taken from them, and for stragglers and supernumerary allies, too deep by 32 feet, which being equal to the 50 and 32 feet 51st mentioned, constitutes the Roman camp as described by him a square, of which the side, however, is 20 feet longer than it ought to be according to Polybius. He also makes the quaestorium and forum too large, and the quarters of the guards too small. He likewise gives the encamping ground of the praefecti of the allies an extent of 50 feet more than that which their own horse and foot cover.

The late major-general Roy has professedly given us a plan and description of a confular camp, and also a plan of a Roman camp, when both confuls encamped together, or within the same intrenchment, in his military antiquities of the Romans in North Britain, published after his death in one volume in folio by the Royal Society of Antiquaries in 1793. But not being acquainted with the Greek language, he took the accuracy of Mr. Hampsdon's translation of Polybius for granted, as he himself informs us, supposing with him the cavalry of the allies to have been triple that of the Romans, and on that erroneous supposition has grounded all his computations respecting their castration, and particularly in comparing the Polybian camp with those in Scotland, that were first discovered by the learned, ingenious, and very able military antiquarian, general Melville, in 1754, who manifested a very fine and superior degree of discrimination in concluding from Tacitus's narrative, and the reasons of war, that Agricola must have crossed the Tay above Perth, and proceeded along Strathmore, and that there were certainly some remains of his camps still to be found in that vale, in opposition to the opinion of the engineers, who were then employed by government on a survey of that country, and the perverfing affections of one of them in particular, who had actually surveyed the situations, on which they were afterwards discovered by general, then captain, Melville, without knowing what they were. General Roy received from captain Melville, who was about to leave this country and repair to the West Indies, a communication of that discovery, and first learnt from him, as he himself acknowledges, what was really meant by a temporary Roman camp, which information excited his curiosity, and led him to turn his attention to the subject of Roman military antiquities in Great Britain. But though he professed it occasionally for a number of years with a very laudable degree of zeal and industry, it must be allowed, that he committed several material and great mistakes in his plan and description of the Polybian confular camp.

He leaves out the space fifty feet wide behind the tents of the tribunes, expressly allotted by Polybius for their horses, &c.

He does not make the extent of the tribes incamped ground transferey across the camp, so great as that of the Roman horse and foot, by about one hundred and fifty feet, leaving a distance of about two hundred feet between their first tents on the right and left; whereas Polybius tells us, that the one was equal to the other. His words are these: αναγκή διαλλάθαι μη ἑν τῷ τῶν χλωρίων σταθμῷ, τότε γὰρ τῷ τῆς θαλαττῆς τοῦ Ρωμαίων ἐπεστάλλετο τοίχῳ.

He leaves an open place or front of twenty five feet wide on the left of the praetorium, between it and the forum; then sets off a rectangular space of the same depth with the praetorium, and about one hundred and thirty feet wide, which he divides equally into two parts, one next to the tents of the tribes as quarters for the legati, and the other immediately behind that for the market-place, or fort, and his other parts of the ground, which is fifty feet wide; and on the remainder of the ground set apart for Polybius, for the forum, extending as far as that occupied by the first tent of the tribunes on the left he encamps one half of the ablest, or select horse of the allies for the confular guard. He then leaves a front fifty feet wide, making that between the halfati and horse of the allies on the left extend quite to the rear of the camp, then encamps half the evocati and volunteer horse looking toward the praetorium, and close behind them, with their backs to theirs, half the evocati, or volunteer foot; then leaves another front of twenty-five feet, and beyond that encamps half the select foot of the allies for the confular guard. On the right of the praetorium, he in like manner leaves a front twenty five feet wide, then sets off a rectangular space as deep as the praetorium, and about one hundred and thirty feet broad for the quattuor's quarters, and for the clothing, arms, and provisions behind them; then leaves another front twenty five feet wide; then encamps the other half of the ablest, or select horse of the allies for the confular guard; and so on as on the left. In making all these fronts, divisons, allotments, and allocations, he is so far from being invested by Polybius, that they are in direct repugnance and contradiction to that author's authority, who makes no mention at all of legati, but allows about five times as much ground for the forum, and about twice and a half as much for the quaestorium as he does.

On
CAMP.

On each side of the street fifty feet wide, leading to the rear from that of one hundred feet in width behind the praetorium, he allot a rectangular space of four hundred feet by one hundred and twenty five for the extraordinary horde of the allies facing the said broad street, and an equal space on each side for the extraordinary foot of the allies immediately behind them and facing the rampart; then leaves on each side a street fifty feet wide, and fully makes two rectangular locations of four hundred feet by two hundred and fifty each for rafters coming to the camp, thus predisposing allowing for occasional comers, as much ground as he allot for the encampment of all the haftri and principles, with four fifth's of the envies of a complete Roman legion. The truth indeed is this: he makes the depth of the encamping ground in the rear of the praetorium one hundred and eighty three feet, and one third of a foot greater than it ought to be by Polybium's account of the Roman castration. And his camp taken altogether differs widely and essentially from the one described by that author. For he makes each side of the encampment one hundred and thirty three feet, and one third of a foot longer than it should be, and each side of the intrenchment also of course. Of this, it seems to have been partly aware himself: for in page 45 of his work, when he utes in the text these words, "therefore the side of the front he was to have been intrenched of a confular army was two thousand one hundred and fifty Roman feet," he in a note expresses himself in the following: "If according to Lippius and others, who have copied from him, there had only been in the confular camp twice the number of allied foot [he must unquestionably have meant to say allied haftri] than there was of Roman horse, then the space actually occupied by the troops would have been a square of sixteen hundred and sixteen Roman feet, and two thirds of a foot." It is much to be regretted that there are so many palpable errors and misprints in that elaborate, and in many respects valuable performance, which might have easily been avoided by a little proper attention to the printing of it. They are so numerous indeed, that we cannot allow ourselves to regard it as a correct copy of the manuscript, he left behind him.

The square was the most convenient and best figure the Romans could have adopted for their encampments. Of all right-angled quadrilateral figures of the same perimeter, its area is a maximum, or the greatest. It therefore required less extent of intrenchment than a rectangle of the same area or superficial contents. And if we examine the disposition or arrangement of the various locations they made within it for their troops, taking into consideration at the same time, the irrevocable simplicity and regularity of their method of encamping, we shall find, that there neither was any ground left nor any wanted to render it more commodious, and be apt to regard it as the best perhaps, that could have been contrived before the invention of gunpowder, and the use of fire-arms, which have made great and essential alterations necessary.

Even in modern encampments, however, so much of the Roman method is still retained by all nations, that in encamping their troops, they constantly place the privates in the front, behind them the subalterns, then the captains, and in the rear of these the field-officers. And Frederick the Great, king of Prussia, tells us, that it was his custom, in imitation of the Romans, to enclose his camps with intrenchments, which, besides awakening other good purpoises, contributed greatly to prevent defection.

We shall now proceed to give an account of modern castration, which is also regulated, in a great measure, by certain rules, that are liable, however, to be altered and varied in different situations and positions, so as to occupy the ground to the best advantage, and most commodiously for the free and useful operations of the different descriptions of troops, according to the opinion and judgment of the general, or officer commanding them.

Camps take different names, or denominations, from the objects those have in view who form them; such as for instance:

- Camps offensive, A camp for forage.
- Camps defensive, A camp of observation.
- Camp of rendezvous, A covering camp.
- Camp of baggage, An entrenched or entrenched camp.
- Camp of retreat or reserve, A fixed or standing camp.
- A flying camp, A camp of peace and exercise.
- A camp of encasement, or a camp for the attack, interruption, and annoyance of an enemy.

The principal objects which every general either has, or ought to have in view when he chooses ground for a camp, are of two kinds, the one offensive, and the other defensive. The camp in which an army assemble, at the beginning of, or the opening of, a campaign, is of the first class or description. In such camps, attention ought chiefly to be paid to the convenience of the troops, who should encamp in small separate corps near their magazines, or depots, in such a manner, as to be able to unite in a short time. And as such camps are generally at some distance from the enemy, there is little or no danger to be apprehended from making the convenience and accommodation of the troops the first object of attention.

The most essential properties of every camp are health,fulness, and security. These are advantages which ought to be attended to and sought after on all occasions. But an attention to wholesomeness is still more necessary in one that is to be occupied for a considerable length of time, than in another, where troops are to make but a short lay. Low, wet, damp, and marshy places should be avoided in every country; and in hot climates, situations that are much exposed to the burning heat of the sun. On the other hand, riding grounds with an even aspect, commodiously situated for agriculture, and for supplies of water, forage, and fuel, ought to be preferred to other situations for encampments.

A general ought to be a good judge of situations himself, and to choose his own camps. His knowledge should not, as is sometimes the case, be confined to the mere rudiments of the art of war, or to the fiddly fiddle busines of parades, reviews, and sham fights, that have no resemblance whatever to real actions. He should be able to discern at sight, or to discover with a glance of his eye, all the possible advantages, as it were, which any part or position is capable of affording, and to improve this talent in practice, by the principles of fortification, which are the basis, or ground-work of it, and which he ought to carry with him into the field, and apply to every situation of his army, availing himself of heights, defiles, rivers, rivulets, morasses, inundations, woods, &c. When master of the rules of that science, he can also apply it successfully for finding out the weaknesses of the enemy's position and order of battle.

A camp offensive, or of offence, is formed for the purpose of annoying an enemy in various ways, such as for instance, as to force him to raise a siege by cutting off, or straightening his intercources with the adjacent parts of the country and his own depots; to compel him to quit an advantageous position by either attacking it at all if necessary, or by inveigling one of his towns or places; to make incursions.
fions into some one or other of his provinces; to intercept his convoys; to embarrass his communications; to confound the forage he might draw benefit and advantage from; &c.

As security is always one of the first objects of consideration, every camp, of whatever species or description it may be, ought to have its front and flanks placed entirely out of the reach of insult. In any situation, therefore, that is chosen or fixed on for a camp, (and there are various ways of occupying the same ground,) care should be taken not to extend either flank towards the enemy, or to expose it to commanding ground within cannon-shot, that he may have in his power to occupy or possess himself of, but to place it in such a manner as to make it afford support to both wings of the army. It ought to be guarded and secured both in front and rear by detachments; and particular attention should be paid to its lying commodiously for pasture, forage, water, and wood, which is not only useful as fuel, but for pickets, picketlines, and other purposes. It should also be conveniently situated for the army that occupies it, to move out of it either to form in order of battle, or to abandon it altogether without being exposed to much molestation from the enemy, who, if he command the principal avenues or approaches to it, would have it in his power to shunt them up, and thereby force them either to surrender, or to attack and fight him on very disadvantageous terms. There are many situations that appear to be very strong, and naturally are so, which from this very circumstance of troops not being able to quit them when necessary without exposing themselves, are in reality both weak and dangerous. And an unskilful general may be led by the mere appearance of them into great mistakes, and thereby, not only draw disgrace on himself and his troops, but also plunge his country into the most disastrous calamities. But a knowledge of fortification will enable a commander of naturally good talents to choose heights, and occupy them in such a manner, as to prevent their being commanded by others; to cover his flanks effectually, so as to secure each post as to render it capable of defence, and to avoid those, in which a gallant officer cannot maintain his ground, without running the risk of losing his reputation.

Camps defensive, or camps of defence. Such camps are strong by their situations chiefly, and have no other design than that of preventing attacks. Every situation that has its front and flanks equally strong, and is free and open behind, is proper for this sort of camps. There are heights that have a front of a certain extent, and their flanks covered by morasses, and positions, that are secured in front by a river or marshy rivulet, and their flanks by ponds. Such camps having no other object than to prevent their being attacked by the enemy, great care should be taken not to fix on false points of support. For this purpose, the rivers and marshes in their front, and on their flanks, ought to be founded in order to ascertain whether the rivers are not fordable, and the marshes impassable.

When such a camp has a river in its front, it should not be placed nearer to the bank thereof than eight hundred or a thousand paces, in order to leave ground sufficient for drawing up the army in order of battle.

Positions taken under the protection of towns or places, are defensive camps.

When the object of a defensive camp is to cover a country, the principal attention of a general in chusing it ought to be directed to those points, which the enemy has it in his power to attack, and by which he might penetrate.

Camp of rendezvous. When at the commencement of a war, or the opening of a campaign, an army is brought together in the field, either in one entire body, or in a separate corps, or parties, at no great distance from one another, it is said to be in a camp of rendezvous. Such a camp is either more or less out of the reach of the enemy, and in the first of these cases the convenience of the troops ought to be the first object of attention. It is also sometimes intended to be offensive, and sometimes defensive. When it is formed for the purpose of offensive operations the following maxims ought to be observed:

To avoid extending either flank towards the enemy, or exposing it to ground that he can take possession of; to choose a position for it strong by nature; to support well the wings; and to secure it against surprize or any sudden assault by detachments, both in front of, and behind it.

To proportion its extent to the strength of the army.

If you are in an open and level country, to encamp your army in order of battle, and if you cannot secure your camp against insult or surprize by detachments, to throw up intrenchments sufficient to prevent your being obliged to fight contrary to your intention or inclination, or when it is not necessary for you to come to action.

In a broken or uneven country, to separate your army without encamping the different corps at too great a distance from one another, occupying the highways, villages, &c. in your front.

In a mountainous country, to encamp your troops according to the situation and nature of the ground, but in such a manner that the most advanced corps may receive prompt aid and support from the rest.

Not to place your cavalry on either wing when it is near a wood, village, or other place, into which the enemy can throw in some of his infantry; but sometimes to place them all on one wing, and sometimes to encamp them in a second line, or otherwise, as the ground and circumstances may point out.

When the enemy is on the opposite side of a river, rivulet, moras, &c. to encamp at a sufficient distance from it to prevent your being incommode by his fire, in even forming your army in order of battle in front of your own camp.

To reconnoitre the highways, rivers, rising grounds, rivulets, ferries, cattles, woods, and other places in the neighborhood of your camp; and to keep open a communication between its rear and several roads, for the purpose of receiving supplies of provisions, &c.

To choose your camp in such a manner, that the enemy, by moving on his right or left, may not oblige you to quit your position, but on the contrary, that by making a short or small movement yourself you may compel him to make a long or circuitous one, and to quit his position or leave the country.

This is the surest criterion by which one can judge of the skilful or unskilful choice of a camp.

And, in short, though you are acting offensively, to take every possible precaution for the security of your camp when the enemy is near you, and by no means to despise him. For negligence and contempt of an enemy tend always to render him bold and enterprising.

When defensive operations are the object of a camp of rendezvous, it is necessary to observe, besides these, the following maxims:

To avoid encamping in a plain or level country.

To attend particularly to the extent of the ground you occupy, and to the number and nature of the troops your army is composed of.

Always to entrench your camp, taking care that no part of it can be enfiladed.

To occupy the bridges and fords of rivers, &c. and if you are
are apprehensive of suffering by inundations, to make dikes to turn the course of the water.

To avoid placing either of your wings behind a morass, or any thing else, that may be an obstacle to its manoeuvring easily, and co-operating with the rest of your army in case of an attack.

To place your artillery on heights, and dispose of it in situations from which it can do most execution.

And to keep open a free and convenient escape from it in the rear, that your retreat may not be cut off.

A camp of passage. In an offensive war troops encamp transitively, when they march either to attack an enemy, or to dilodge or force him from a post, by different manoeuvres; or to get before him to some passage, and penetrate into his country; or to invest a place, and form the siege of it; or, in short, to join an advanced corps or army.

In a defensive, as well as an offensive war, they occupy a camp of passage when they take post to cover their country; when they are obliged to regulate their movements by those of their enemy; when their object is to effect some junction; or, finally, when they are constrained to abandon a post, a frontier, or even one part of their country to cover another.

A camp of rest or repose, is that in which troops either wait for forage, or watch the enemy's motions, in order to regulate theirs by his, or in which they are allowed to remain for some time stationary on account of sickness or some other cause. As repose is the sole object in such a camp, it should have such a river or morass in its front as renders it inaccessible. And if the river, rivulet, or morass in front of it has not a sufficient depth of water it should be dammed up so as to be impassable.

Such a camp should not only have its front naturally strong, but also have a site or situation that is elevated and healthy; and when it is of a permanent nature, it should have abundance of water, wood, forage, and provisions, within its reach and command, and should cover the road or route of all its convoys.

A fixed or flable camp may have different objects, according as an army acts offensively or defensively.

When it is on the offensive, it occupies such a camp for a certain time, to form the siege or blockade of a place; to wait the effect of a diversion or the capture of a place, which a detached corps has been sent to attack; to give a reinforcement or convoy time to arrive; to confine or destroy, during the course, or towards the end of the campaign, the forage or subsistence of a country, which they design to abandon; to give rest or repose to an army after a long march or operation that may have caused a loss of men, or occasioned disaffections or, in fine, during the course of a campaign, that has not been so prosperous or fortunate as was at first expected.

When a general encamps before a place to attack it, which he knows the enemy cannot assemble a sufficient force to attempt the relief of, and when he has little to fear from any detachments he may send out, either for that purpose or to interrupt the operations of the siege, he has then only to circulate his troops round the place as commodiously as he can, feizing on commanding grounds and other advantageous objects, and taking care to have his circumsallation as near to it as possible, provided he is just out of the reach of annoyance from the besieged's shot and shells.

When he is on the defensive, he chooses a flable camp to cover his country, or some place of importance, that the enemy designs to besiege. Besides these two objects, a flable camp has several others, which are common to it with camps of other denominations. There is one, however, which it may not be improper to mention, which is this, that a general can remain in it till he sees his enemy separate his forces, and send them into winter quarters, in order that he may go into his own without dread of disquietude or modulation.

A flying camp denotes a corps or body of troops consisting of three, four, five, six, &c. thousand men, infantry and cavalry, that has power to encamp and decamp at the pleasure of the general or officer commanding it, as necessity and circumstances may require, that is continually in the field, and is constantly making divers movements to harass the enemy, fling his incursions, check and render abortive his enterprises, intercept his convoys, seize and fatigue the neighboring country, and to throw itself, in case of need, into a besieged place, that is in want of succour or assistance.

Though there is some difference between the command of a flying camp and a large army, the resemblance, however, is so great, that a general officer, who has often commanded a detached or separate body of troops in, ceteris paribus, fitter for the command of a large army than one who has not enjoyed that advantage.

A general officer, therefore, who is ambitious of preference, anxiously endeavours to procure for himself such commands and to qualify himself for them.

A flying camp occupies much uneasiness and disquietude to an enemy, by hovering on his wings. It is designed to cover some tract of country between two armies; to make head against some similar corps, that the enemy has formed or detached; to undertake and execute some particular enterprises; to throw troops into some place that is menaced or threatened; to draw contributions from certain districts, and to regulate its movements at the same time, in such a manner as always to have it in its place and form the main army after a march of one or two days at most, in order that, if a favourable opportunity for a general engagement should present itself, it may arrive in time to take a share in it.

The general, who commands a flying camp, ought to be extremely attentive and vigilant, to have his troops highly disciplined, to suffer no straggling or dispersion of them, to march with great precaution, to choose advantageous camps, and to regulate its movements in such a manner as to be always in readiness to surprize his enemy when it is possible, without running the risk of being surprized himself. He should be alert against all sorts of enterprises on the part of the enemy. He ought to have parties always on the look out, and to relieve them; and he should not be sparing in the employment of spies, of whom he may have enough if he only pays them well. Money can seldom be more usefully employed.

A camp of peace and exercise, is a camp defined for the exercise of all the military duties and functions.

In such peaceable encampments the troops should be trained up and instructed in every part of fatigue, labour, and duty, which is necessary on actual service, for rendering warfare successful. In such a situation an active and able general will not only have them practised in throwing up works expeditiously, but will also turn a great part of his attention to their discipline. He will make them encamp in order of battle, and cause every part and branch of the service to be performed with as minute accuracy, and as punctual an observance of orders, as if they were in the field, or in the face of an enemy. He will examine whether the officers on guard are sufficiently vigilant and acquainted with every particular of their duty, and whether the soldiers themselves are posted according to orders. He will not only have the infantry exercised frequently, but the cavalry also, when they are not employed in foraging, and
the recruits of both daily. He will inspect and look at the horses himself, praising those officers, who have been care-
ful of them, and severely reprimanding those who have neglec-
ted to have them taken care of. In short, he will by his vigilance and attention, in making every part of his army perform its duty with punctuality and exactness, give activi-
ty, skill, and animation to the whole, and prepare them for acting with vigour, advantage, and success against an enemy.

A camp of forage, or for foraging. Such camps are some-
times at a distance from and sometimes near to the enemy. In the first case, neither your camps nor foraging parties are in danger of molestation or insult. There are certain precautions, however, that ought never to be neglected, even when you have nothing to apprehend from any attempts of the enemy. Your camps therefore ought, in either case, to be strong by nature, or rendered so by art, and particu-
larly in the last, when you are near to an enemy. Besides, a strong camp enables you to send out stronger foraging detachments than you could otherwise venture to do; and on this service it is sometimes necessary to employ a great part of your army. Foraging is certainly an essential part of the art of war; and parties of foragers may very justly be con-
sidered as detachments sent out against the enemy. A rich and fertile tract or district of country should be chosen for it, and secrecy ought to be observed in regard to the time when, and the place where, you intend to forage. Your orders respecting this service should not be communicated even to the officer, who is to command the troops employed on it, till late in the evening before it is to be performed. You ought, on such occasions, to detach a number of small parties to acquire an exact knowledge of the enemy’s motions. And, if you are on your guard against stratagems, it will be safer for you to forage when he does than at other times.

A camp of observation is the camp of an army employed in watching the motions and operations of an enemy, in harassling and perplexing him, and preventing him from pen-
etrating in a country or tract of territory, to surprize or take an important place, or to molest another army, and force it to abandon its preconcerted enterprises and designs. An army of observation, during a siege, is almost always in motion, and on the look out, occupies the avenues or approaches by which the enemy can present himself, follows him in his movements, keeping parallel to him, but continually between him and the besieging army, in the most advantageous manner it can, to avoid being obliged to fight contrary to its inclination, and sometimes feizes on a commanding post, and there entrenches itself, when its camp may be called.

A covering camp, which appellation is given both to such an encampment for covering a siege, and to positions chosen for camps that are designed to cover a country or district. In choosing one for the last of these objects it is not neces-
fary to pay so much attention to the natural strength of the place itself as to the parts or paffes, through which the enemy may or might attempt to penetrate, if he expects to penetrate at all. These should be occupied and secured by your army, in those places where they are most easily de-
defended, and where he cannot attack you without great hazard and danger. By acting judiciously in this manner you will, with very inconsiderable movements on your part, oblige him to take long and circuitous routes, and thereby harass his troops without being able to carry on any solid operations.

An intrenched or retrenched camp. Such a camp is some-
times made during a campaign on the field, sometimes
before a place, and sometimes under a place.

The ancients, and particularly the Romans, did not re-
main, even for an inconsiderable length of time, in any place
without fortifying it. Their intrenchments did not hinder
them from marching against the enemy when it was thought
proper; but they put their armies out of the reach of insult,
particularly when they were composed of new levies or of raw
and inexperienced troops, furnished places of security for
their baggage and provisions, and enabled them to send out
large foraging detachments without exposing their camps to
insult.

It is not sufficient, when one is on the defensive, to have
your camp on a situation naturally strong. It is also nec-

essary, particularly when the enemy is under the necessity of
coming to attack you, to remedy and remove the smallest de-
fects of ground or position by intrenchments, which put you
completely under cover, and place you in a condition to make
a vigorous and obdurate defence.

In an open or level country, it is advisable for you, in
contructing your intrenchments, to avail yourself of every
advantage that the ground offers, to profit by rivers, rivulets,
rouelles, canals, marshes, hollow ways, ditches, villages,
inclosures, caftles, &c. and to proportion the relative de-
grees of strength in your intrenchments, in different places,
in such a manner as to render every part of your position
equally strong.

In a woody and mountainous country, you should not
only take all the precautions necessary to be observed in an
open and level one, but ought also to make abatiss, dikes,
batardeaux, &c.

An intrenched or retrenched camp before a place, has for
its object both offence and defence, when the enemy is either
in sufficient strength to attempt to raise the siege, and to
throw in succour and relief to the besieged, to enable them
to hold out for a longer time than they otherwise would be
able, or when the besieged themselves are sufficiently nu-
merous to make strong and frequent molestations. In the first case a
line of circumanvallation is made to secure the besieger’s army,
against all attempts from without; and in the second a line of
contravallation is thrown up between the besieger’s camp
and the place, to prevent any molestation or interruption on
the part of the besieged from within.

In constructing both these lines you should be particularly
careful to occupy the most commanding and advantageous
ground round the place, whether it be a little farther from
or nearer to it than you could with, availing yourself of
heights, ravines, &c, and making use of abatiss where there
is wood, and every thing else from which you can derive
advantage. If they are intersected by rivers, rivulets, canals,
morasses, &c. you should have secure and convenient bridges
and ways of communication between the different parts.

An army of observation is even of the greatest ad-
vantage at the commencement of a siege. It watches
over the besieger’s preservation till he firmly establishes him-
self, can forward his operations, escort his convoys, supply
him with forage, and perform many other sorts of labour
for him. These two armies should always be within reach of
each other, particularly at the beginning, that they may be
able to afford mutual aid and succour to each other, and
keep the enemy at a distance, who will naturally be afraid
of approaching too near, if they are too powerful for him,
left they should fall upon him conjointly, and attack him
with advantage.

Intrenched or retrenched camps under places, which are
attributed by some to the celebrated marshal Vauban, who
recommends the forming of them at most frontier places,
have defence only for their object. A camp of this sort
may have one particular object only, or several objects at
once.
Once near or under a place of importance, it serves to render the attempt to besiege it the more difficult, and to retard or hinder the taking of it. Under a place, surrounded by heights, as well as one that has only a single moat or ditch fortifications, it becomes necessary for its defence. When there is a number of troops in a place, it is useful for assembling them in, for placing them advantageously, and for putting them in a condition to attack the enemy, as occasion may present itself. It is a support for an army that is not strong enough to take the field, and is convenient for the inhabitants of the neighbourhood to retire to with their effects.

The depth of a regiment of infantry encamped, consisting of nine companies of 100 men each, from the teretians' tents to the rear, used to be 200 yards, and the front 215, including the battle-guns. A regiment of infantry of the same strength is now allowed 200 yards in front, including its two battle-guns, and 520 yards in depth.

A regiment of dragoons encamped, consisting of six troops that form three squadrons, with the light troops, used to take up 200 yards in front and 258 in depth; and the interval between two regiments of infantry or cavalry used to be 65 yards.

A squadron of horse has now a front of 120 yards; and an interval of 100 feet is allowed between each regiment.

The forming of an intrenched camp, near a town or village, is attended with many advantages. It furnishes room for establishing magazines for stores, forage, baggage, and for the sick and wounded. The houses and buildings help to cover its flanks, and thereby enable you to render it more compact, than it otherwise could be made. Such a camp also covers and protects a place that has not works, or fortifications sufficiently strong to repel an enemy. When the ground is favourable for the purpose, such a camp may be formed in the figure of a square, or nearly so, which will require much less extent of intrenchment than a long rectangular one, and is more defensible.

Some able generals have been for rejecting lines altogether; among which number is the celebrated marshial Saxe, who is a great advocate, however, for redoubts in front of an army, and mentions particularly the wonderful advantage they were of to Peter the Great and the Muscovites at the battle of Pultowa. It must be allowed that lines and intrenchments are often thrown up on a campaign very injudiciously, and to little purpose; and unless some parts of them be closed in the rear, they are totally lost the moment they are forced or carried in any one point. But such temporary lines and intrenchments for stationary camps are different from those we have just been speaking of, either before or under places.

Frederick II., king of Prussia, has proposed to form lines or retriments with square redoubts, placed in faint and re-entering angles, with an angle of each outwards or towards the enemy, joining them with trenches, as in fig. 4. Plate v. Military, &c. He observes, that the redoubts in the faint angles ought not to be above 600 paces distant from one another; but 600 yards are distance enough. And the ingenious general Lloyd has proposed a similar arrangement of redoubts, in front of an army drawn up in order of battle, without joining them with trenches, but leaving the intervals between them open.

Fig. 1. Plate v. is marshial Vauban's form of lines, and figures 2. and 3. are his first and second profiles of them.

Fig. 5. is a form for lines, with bastions and broken curvatures.

Campe, city, coffina urbana, was a place near the city, not far from the six mountains, where the pretorian guard were encamped; whence it was also called the pretorian camp, pretorian camp, or pretorian. The like we all read of by St. Luke, called by St. Luke absolutely the camps Campaspar. By which we are doubtless to understand the camp parum, which Josephus tells us, was afterwards used as a cauld.

Campe, naval, coffina marina, those made in figure of a half moon.

Campe, naval, coffina majora, or married, denoted a station of ships.

Campe, summer, coffina estus, among the Romans, was ordinarily light and moveable; so that they might be let up, or taken down, and removed in a night. In which case it was also called simply coffina. See CAMP.

Campe, winter, coffina hiberna, or winter quarters, were usually taken up in some city or town; or else so contrived as to make almost a town of themselves. See CAMP.

Camps, territories, coffina territoria, those which were a third part longer than broad, which Hyginus represents as the Roman model. Coffina in quantum fieri potuerit territiae effe debentum—una pagina in longum duo millia quadrigenti, in latum millia sexcenti pedes.

CAMP is also used among the Siamese and East Indians, for a quarter of a town assigned to foreigners, wherein to carry on their commerce.

In these camps, each nation forms itself a kind of city apart, in which their houses and shops are, and the factors and their family reside.

The Europeans at Siam, and in most other cities of the East, are exempted from this restraint, and allowed to live in the cities and suburbs, as they find them most commodious.

CAMP COLOURS-MEN, are soldiers appointed to attend and affil the quarter-master general, in marking out, and keeping the camp clean, receiving and distributing provisions, &c.

The camp colours-men are drawn a man out of a company, that are exempt from all other duty during the campaign; each carries either a spade or a hatchet, or a pole bearing colours.

CAMP Diseases, or the diseases incident to armies, are such as arise chiefly from exposure to the heat and inclemency of the weather, and from infection. Consequendy they are different, according to the season of the year, and to the climate and soil of the country in which the army is engaged. The ancient maxim of Hippocrates, that "the summer and autumnal fevers are the most sickly," is confirmed by Sir John Pringle, not only with regard to warm climates, but to every camp, where men are necessarily much exposed to heat and moisture, the great cause of putrid and contagious diseases. (Obf. on Diet. of the Army, P. II. ch. i.) The diseases of summer and autumn are, remitting and intermitting fevers, cholera, and dysentery. But the latter, though produced by heat and moisture, is propagated extensitively by contagion: it declines, however, with the autumn; but the remitting fevers continue as long as the encampment, and never entirely cease till the floods begin. In the winter, inflammatory diseases chiefly prevail, such as coughs, pleuritics, acute rheumatism, inflammation of the brain, bowels, and other less important parts; and the consequences of these are
are often consumptions, chronic coughs, and rheumatism.

Independently of the noxious effluvia from marshes, from the privies of the camp, and the putrid draw in the tents, which spread disease through a camp, the soldiers are often attacked with the typhous or putrid fever, when crowded together in hospitals and barracks in consequence of the confined air; hence this fever has been designated the hospital fever.

There are other causes also, which contribute to the production of diseases in an army, partly by predisposing the body to be more easily affected by noxious agents, and partly by actually exciting disease; such are errors and irregularities in diet, the use of bad water, intemperance in spirits, the extremes of fatigue and inactivity, loss of rest, and want of cleanliness. The means of limiting the operation of these causes were suggested by Drs. Pringle, Monro, and other authors; and considerable improvements in the clothing, and means of subsistence of the men, in the ventilation of hospitals, &c. have been adopted, by which the number and mortality of camp-diseases are somewhat diminished.

Camp duty, in its utmost extent, includes every part of the service performed by the troops during the campaign. But in a more particular sense, it denotes the duty performed by guards and detachments, for the security of the camps, and preventing forgeries.

Part of the camp duty is performed in the same manner as that of a garrison.

Camp fight, or Camps fight, in Law Writers, denotes the trial of a cause by duel, or a legal combat of two champions in the field, for the decision of some controversy.

In the trial by camp fight, the accuser was, with the peril of his own body, to prove the accused guilty; and by offering him his glove, to challenge him to this trial, which the other must either accept of, or acknowledge himself guilty of the crime whereof he was accused.

If it were a crime deserving death, the camp fight was for life and death: if the offence deferred only imprisonment, the camp-fight was accomplished when one combatant had subdued the other, so as either to make him yield, or take him prisoner. The accuser had liberty to chuse another to fight in his stead, but the accuser was obliged to perform it in his own person, and with equality of weapons.

No women were permitted to be spectators, nor men under the age of thirteen. The priest and the people, who looked on, were engaged silently in prayer, that the victory might fall on him that was right. None might cry, shriek, or give the leafy sign; which, in some places, was executed with so much skill, that the executioner stood ready with an axe to cut off the right hand or foot of the party that should offend herein.

He that, being wounded, yielded himself, was at the other's mercy, either to be killed or suffered to live. But if life were granted him, he was declared innocent by the judge, and disabled from ever bearing arms, or riding on horseback. Verdeg. Rell. Dec. Intell. cap. iii. p. 51. See Across, fight, Battle, Champion, and Combat.

Camp hospital. See Hospital.

Camp law, a method of deciding controversies by duel or camp-fight.

Camp-mills, in the Military Art, denote portable or moveable mills, which can be used, particularly in time of war, when there are neither wind-mills nor water-mills in the neighbourhood, and which, on that account, formerly accompanied armies, in the same manner as camp-ovens and camp-forges. Some of these mills have flours for grinding the corn, and others are constructed with a toothed roller like those of our coffee-mills. Some of them are also so constructed, that the machinery is put in motion by the revolution of the wheels of the carriage, in which they are placed; and others, more commonly, are driven by horses or men, after the wheels of the carriages are sunk in the ground, or fastened in some other manner. The invention is ascribed to Pompon Targonne, engineer to the marquis Spinola, about the end of the 16th century. Others ascribe the invention to the Germans, about the year 1563. Beckmann's Hill. Invent. vol. iii. p. 190.

Camp of Gold Club, in History, a denomination given to the scene of interview between the kings of France and England, Francis and Henry, and their respective queens, in 1519; held between Ardres and Guines. This interview was conducted with singular magnificence and splendour; it lasted 10 or 12 days, exhausted the treasures of both monarchs, ruined many of their nobility, and terminated without answering any useful purpose.

Campach, in Geography, a river of Carinthia, which runs into the Moil, near Velsch.

Campagna, in Ancient Geography, a town of Cappadocia, in the department of Cilicia. Poikley.

Campagna, in Geography, a town of Naples, in Principato Citra; the see of a bishop, suffragan of Conza; 16 miles E. N. E. from Salerno, and 13 S. S. W. from Conza.

Campagna di Roma, formerly Campania, a province of Italy, in the state of the church, comprehending the greater part of ancient Latium, and bounded on the north by the river Sabina, on the east and south-east by Abruzzo Ultra and Lavoro, on the south-west by the Mediterranean, and on the north-west by the Patrimony of St. Peter. It is about 60 miles long on the Mediterranean sea, and 33 broad. The country contains many beautiful plains, and the soil is fertile; but a great part of it is infaluable on account of the Pontine marshes, so that there are few towns or villages, and the inhabitants are poor. Several attempts have been made to drain these marshes, and they are now traversed by a firm road. By these means, and some internal regulations in favour of the husbandmen, the infalubrity of the air is likely to be corrected, and the population and fertility of the province increased. The unleasement of the climate in this province is said to have commenced after the invasion of the Goths in the 5th and 6th centuries; and to have been owing to the accumulated ruins of the edifices of Rome, which raised the bed of the Tiber, and caused its waters to flagrate and to overflow. The exhalations proceeding from such a mass of flagrated waters, contributed very much to infect the air of this hot climate. This evil, resulting from the same cause, was aggravated as long as Rome was exposed to the incurious and devastations of the Lombards, the Normans, and the Saracens, which lasted for several centuries. At the beginning of the 13th century, the air was become infectious, that Pope Innocent III. says, that few people at Rome attained to the age of 40 years, and that it was very uncommon to see a person of 60. When the papal see was transferred to Avignon, and during the 72 years of its continuance there, Rome became a desert. Its monasteries were converted into flabeles; and Gregory XI. on his return to Rome in 1376, could scarcely count in it 30,000 inhabitants. His death was succeeded by the Western Iehfim, which continued upwards of 50 years; and when this fehism terminated in 1492, Martin V. and those who immediately succeeded him, were able to make but feeble efforts against to inveterate an evil. It was not till the commencement of the
the 16th century, that Leo X. vigorously attempted to restore the salubrity of the air; but the two sieges of Charles V., plunged it again into its old calamities; and the number of inhabitants, which in the time of Leo X. amounted to 85,000, was reduced under Clement VIII. to 32,000. Since the time of Pius V. and Sixtus V. towards the close of the 16th century, the popes have been ambitious in their endeavors to purify the air of Rome and its environs, by procuring proper discharges for the waters, drying up the moli and marshy grounds, and covering the banks of the Tiber and other places that were deemed uninhabitable with superb edifices. Since that time a person may dwell at Rome, and go in or out of it, at all seasons of the year. But at the beginning of the 17th century, they never ventured to sleep at Rome, even in the day, in any other house beside their own. But these scruples, says M. Condamine, have of late very much subsided; and he says, that he has seen cardinals, in the months of July and August, go from Rome to live at Frascati, Tivoli, Alban, &c. and then return the next or the following days to the city without any detriment to their health; and he adds, that he has himself tried all these experiments, without the least inconvenience. "We have even seen," he says, "in the last war in Italy, two armies encamped under the walls of Rome, at the time when the heats were the most violent. Nevertheless, the country people in general dare not illib venture to lie, during that feason of the year, nor even so much as sleep in a carriage, in any part of the territory comprehended under the name of the Campagna of Rome." The amphitheatre of hills that bound the Campagna on one side is crowned with towns, villages, and villas, which form very delightful landscapes. The ancient Romans were accustomed to seek shelter from the scorching heats of summer among the woods and lakes of these hills; and the cardinals and Roman princes, at the same season, retire to their villas; while many of the wealthier citizens take lodgings in the villages, during the season of vintage. The principal cities or towns of Campagna, are Rome, Velletri, Frascati, Palestrina, Terracina, Nettuno, and Olbia. N. lat. 41° 18' to 43° 5' E. long. 13° 14' to 13° 26'.

CAMPAGNAC, a town of France, in the department of Aveyron, and chief place of a canton in the district of Millau; the place contains 1,531 inhabitants, and the canton 6107. The territory comprehends 149 kilometres, and 7 communes.

CAMPAGNE, a town of France, in the department of the Straits of Calais, and chief place of a canton in the district of Montreuil; 2 leagues west of Hesdin. The place contains 1209, and the canton 11,508 inhabitants: the territory includes 212 1/4 kilometres and 25 communes.


CAMPAGNOL, of Boffon, is the short tailed rat of English writers, Mus campagnolus of Gfner, and mus arvata of Pallas, Schreiber, &c.

CAMPAIGN signifies a field, an open or level country. In a military point of view, it is used to denote the space of time, every or each year, during which troops are kept embodied as an army, or at least in a condition to float, thwart, or traverse the progress of the enemy.

This term is also employed to express the number of years which an officer or soldier has served. This officer has ten campaigns over his head, that is to say, he has been ten years in the service: this soldier has made sixteen campaigns, that is, he has served sixteen years.

It is likewise made use of to signify the operations of a campaign. Thus we say, he wrote the history of that campaign; by which we mean to say, that he wrote the history of the transactions and operations that took place during that campaign. The general is said to begin or open the campaign when he commences his operations.

The genuine object of a campaign is to attack your enemy, or to defend yourselves, or to succour an ally; and whatever of the be the object, it is necessary to have armies more or less numerous, money to pay them with, and to destroy the other's expenses attending it, and considerable magazines of every sort near the frontiers, where the armies are to assemble and operate. The general plan of a campaign is the result of political deliberation and arrangement, and is regulated by circumstances and conjunctures.

Though campaigns may have different objects, as well as be opened and carried on at different times and seasons, they may all be considered as falling under the following distinctions or denominations:

Offensive campaigns.
Defensive campaigns.
Summer campaigns, and
Winter campaigns.

In an offensive war, you ought to consider whether it is best to act offensively everywhere, or to act on the defensive in one quarter, to enable you to act with more vigour and effect in another. It is most advisable to attack a country of which the conquest has a tendency to lead to a speedy peace, or at least to prove favourable to the opening of the next campaign. But it is of importance, you before undertake any such enterprise, to know to a certainty that the powers, whose jealousy you might excite, will not oppose the conquest you intend to make.

In a defensive war, you ought to consider what frontiers it is of most consequence to defend. When you are inferior to the enemy, and find it difficult to defend your country with small armies, you should take care not to divide your forces, but to keep your troops together in those quarters where you have most to fear, in order to engage him with all your force, should you be under the necessity of fighting him. Such considerations may sometimes determine you to abandon one tract of country, and lay it waste, in order to preserve and protect another of greater importance.

When your object is to conquer or subdue an ally, either in virtue of a treaty concluded with him, or to prevent his being subdued by some formidable power that wishes to invade his country, and strip him of his territories, you should, in the first instance, have some strong and secure places of his put into your hands to prevent his making a peace without your participation and concurrence, and to keep open a safe retreat for you, should you be forced to retire.

In every situation and species of warfare, either in commencing or continuing it, you ought not to enter on a campaign but after much and mature deliberation. You should weigh every circumstance, consider what may happen, and suppose even the worst, that you may not be surprized by incidents or events, but benefit by such as are favourable, and speedily remedy those that are otherwise.

You should not inculc more than one person with the chief command of an army. For persons who enjoy equal authority are generally of different sentiments and opinions; and although no inconvenience arose to the allies from the co-equal and joint command of prince Eugene and John duke of Marlborough, which was owing principally to the prudence and great good sense of the latter, and to a magnanimity of mind natural to both, yet it ought not to be quoted as an example for imitation.

You should keep your preparations as secret as possible, and endeavor to open the campaign with some blow or enterprise of importance, not foisted by the enemy; and when
when you act in concert with allies, you ought to arrange and settle with them a general plan, that your success may be thereby rendered more certain and rapid, and that the operations of the different armies may be so regulated and conducted, particularly in respect of time, which governs in the affairs of war, as to be conducive to the bringing about of the same object or end.

When a general is appointed to act, either offensively or defensively, it is necessary for him to have an exact knowledge of the situation, condition, and nature of the frontier and country where he is to act, to be able to settle properly a particular plan for the campaign. His conduct or management of a campaign is his manner of executing the plan of operations offensive or defensive, that he has formed.

The general maxims for a campaign of offensive operations are chiefly the following:

To undertake no enterprise without mature deliberation.

To observe profound secrecy; as the best plans and designs are those which the enemy is not only ignorant of, but does not even suspect.

After an enterprise is once resolved on, to carry it as speedily into execution as possible.

To undertake no enterprise rashly, but to consider well the possible ways and means of executing it, and to be prepared to overcome with prudence and resolution the probable obstacles you may meet with in the execution.

Before you undertake anything, to form magazines in different situations near your army, and to procure the means of transporting them with facility from one place to another.

When you penetrate into an enemy's country, to advance gradually rather than leave strong fortresses behind you, and not to move unnecessarily to a distance from navigable rivers convenient for the transport of ammunition and provisins.

Not to enter on any enterprise without securing a communication with your depots, and establishing a protection for your convoys.

On entering an enemy's country to make the natives and people believe that your force is much greater than it really is, by undertaking as many enterprises at once as you can with success and safety.

To establish and strengthen yourself in some advantageous position as a central pivot, from which you can support all your subsequent movements.

To study the courage, talents, and disposition of your officers and soldiers, to know which of them are fit for one sort of service or enterprise, and which for another.

To take care to give your orders in writing, always when you can, as clearly and concisely as possible.

To render the condition and situation of the troops as pleasant and comfortable as you are able, whilst you make them observe a rigid and exact discipline, and inure them to exercise and labour.

To conciliate the esteem and affection of your troops.

To choose such advantageous positions as will enable you to support and command all operations to a considerable extent on every side of them, as will force the enemy to quit his and put it in your power by short, sanguine, and easy movements on your part to compel him to make long, toil-some, and circuitous marches.

Not to revile or reproach your troops when they happen to be beaten, but to animate them and renovate their spirits.

To endeavour by every method to procure exact information in regard to the enemy's force and designs; and, above all things, to become acquainted with the real characters, dispositions, ruling passions, and propensities of the generals opposed to you.

These maxims ought also to be observed by a general who is entrusted with the conduct or management of a defensive campaign. There are a few others, however, peculiar to it, which it may not be improper to take notice of.

He should endeavour to discover on what part of his front the enemy intends to assemble his troops, and of the object he has in view, by the situations, number, and nature of his depots; to put himself in a condition to oppose and frustrate his designs by provisioning and furnishing with sufficient supplies the places that are most important and most exposed, by reconnoitering good and strong positions, and by taking every possible measure to prevent anticipation on the part of his opponent.

A general acting defensively should avoid an engagement where inferiority in numbers is of much avail; and, on the other hand, he ought to embrace any favourable opportunity of fighting the enemy in a situation where disposition is everything, and number nothing.

He ought himself to be active, vigilant, bold, enterprising, and capable of enduring fatigue.

He should endeavour, by every stratagem, to draw the enemy into disadvantageous and dangerous situations, where he can attack him with advantage, and without much risk of losing many men.

He ought not to occupy any position which the enemy can surround or flout him up in.

He should, where it is necessary, secure his camp with intrenchments, placing his flanks out of the reach of inful.

A general who has made some conquests, comes to be on the defensive when he is stopped in his career of victory. He should, therefore, seriously consider whether he is able to keep or preserve them; and what measures he ought to adopt for that purpose. For it is sometimes easier to make conquests than to retain them after they are made.

When a general is on the defensive, it is a material consideration for him to be able to foresee in good time and determine where he shall retire to, in order to take up his winter quarters, and to profit himself of everything that can contribute to ensure their tranquillity.

That the close of a campaign he finds he has but little or no country left him to defend, no allies, with whom he can take refuge, or from whom he can receive succour or support, and that his means of repulsing the enemy are exhausted, it is best for him to deem and an amitie, and to open negotiations for peace.

The close, or conclusion of a campaign is the time when the opposing armies go into winter quarters. Sometimes one of them remains in the field longer than the other, but they generally both retire from it at the same time.

Summer campaigns. Almost all campaigns are made in summer, and none in winter, except in cases of necessity, or when great and important advantages are expected to be derived from them.

Campaigns are generally opened in the spring; but some nations are later in opening them than others. In this respect some are necessarily regulated by climate, while others are governed by custom.

It has been customary for most of the nations of Europe to open their campaigns in the month of March. The Turks are always later than them in taking the field, and quit it sooner. This is owing to the great extent of country from which they have to collect their militia, their
great number of cavalry, for which they must have provision, and
the immense quantities of baggage they carry along with them.

Molti generals have undertaken to take the field as soon
as they were in readiness for entering on the campaign, or
as circumstances would permit. But the celebrated and
very successful marshal Saxe was an advocate for taking the
field late in the season. On this subject he expresses himself
in these words:

"Many persons are of opinion that it is advantageous
to take the field early; in which they judge very properly,
provided there is any important poll to be seized or ente-
prise to be executed that requires it; but otherwise I am
far from concurring with them, and think there is no oc-
casion for such precipitate measures, but, on the contrary,
that it is even prudent to remain in winter quarters much
longer than the usual time. The enemy's being suffered to
lay siege to a place is of no signification, because he will
thereby only weaken and dissipate his troops; and if you
fall upon him towards the autumn with an army well
disciplined and in good order, he must infallibly be ruined.
I have always remarked that a single campaign reduces an
army one-third at least, and sometimes one-half, and that the
cavalry, in particular, is in so watchful a condition by the
beginning of October, as to be no longer able to keep the
field."

Winter campaigns, are campaigns carried on in winter.

There are four countries in which the climate is so se-
vere, and the frost so intense, that it is impracticable to make
campaigns in them in winter. But in others, where they are
practicable, in consequence of the mildness of the climate,
there are circumstances that sometimes render them neces-
sary, and point out such great advantages to be derived from them,
though very exhausting and injurious to troops, that a
general does not much hesitate about undertaking them.

If an enemy has taken up his winter quarters in one of
your provinces or districts of country, with the intention of
invading a neighbouring or adjoining province early in the
spring; and you understand that his cantonments are much
scattered or extended, and think you can approach them
without his being apprised of your design in sufficient time
to collect his force, beat them up in succussion or detail, and
disperse his army, obliging him to retire and abandon that
tract of country, you ought to open a winter-campaign for
the accomplishment of such an object.

There are but few circumstances or considerations, how-
ever, that will justify the opening of a winter-campaign,
which ought not on any account almost to be made in a
country where there are many strong places, which cannot be
reduced but by long and tedious sieges.

Frederic II. king of Prussia, who made more winter-
campaigns than any other general of the last century, in
speaking of them expresses himself in the following words:

"Winter-campaigns are the ruin of your troops, not only
on account of the feeble they occasion, but because from
your continual motion they can neither be clothed nor re-
comitted. The same rate of repose prevents all your car-
rriages, &c. from being properly repaired, and ends in their
total destruction.

"Nothing can be more certain than that the best army in
the world cannot long support such campaigns; for which
reason winter expeditions ought by all means to be avoided;
not but that there is a possibility of a general being so cir-
cumstanced as to be obliged to have recourse to that kind of
ruinous war."

CAMPAN, in Geography, a town of France, in the de-
partment of the Higher Pyrenees, and chief place of a can-
ton, in the district of Bagnères, seated in a valley, which
derives from itits name; 1 league S. of Bagnères-en-Bigorre.
The place contains 4,200, and the canton 7,224 inhabitants;
the territory includes 165 square kilometres, and 7 communes.

CAMPANA, a town of Naples, in the province of
Abritato Ultra; 9 miles S.S.E. of Aquila. Also, a town of
Naples, in the province of Calabria Città; 10 miles S.W.
of Caserta. Also, a small island in the South Pacific Ocean,
just the west coast of South America. 3° 45' 50'. W. long.
77° 51'. Also, a river of South America, which runs into
the Pacific Ocean. 3° 45' 50'. W. long. 77° 31'.

CAMPANA, la, a town of Spain, in the country of
Seville; 13 miles W. of Seville.

CAMPANA Flora, in Botany, a name given by Helwing,
and some other of the German authors, to the plant we call
pulchristella, or the purple flower. It was named campiona Flora,
or Flora's bell, by Helwing, because of its being the signal
of the approach of spring. In the Latinian system, this is a
species of the Asenidae.

CAMPANAECI, the thirty-third natural order in the
Philosophia Botanica of Linnæus, and the twenty-ninth of
the Poissonian Lectures published by Grécitz. It contains
the following genera: Erodolus, Convulsus, Ipomæa, Röth, Pulchella, Polygonium, Comanthis, Campanula, Revilla,
Pyrenema, Trachelium, Lobelia, Lobistia, Virta, Prunella.
Thése plants are not mentioned in the Philosophia
Botanica. None of them are arborescent; few fidek; in
all, the leaves are alternate, the calyx five-cleft, the corolla
five-cleft, the flames five, the style one (except in evolva-
lus, in which it is not certain whether it has four styles, or
one style with four stigmas), and the pericarp a capsule.
They are all lacteate, at least when young and tender, and
have a pugnitive, flightly poisonous quality; they have all a
common character, but it is not possible to give them an ex-
cclusive one by which they may be distinguished from all others.

CAMPANARIO, in Geography, a town of Spain, in
New Cuisine; 10 miles from Paluccio-del-Rey.

CAMPANELLA, Thomas, in Biography, a philoso-
pher of Italy, prompted by his genius to bold innovations,
and remarkable for the sufferings occasioned by them, was
born at Stilo, a village of Calabria, in 1568, and dignified
himself, at a very early period, by his talents and appli-
cation. At the age of 14 years he wrote verses with great
facility; and in his 15th year he entered into the order of
the Dominicans. Having acquainted himself betimes with the
scholastic theology of the age, in which he lived, he
directed his attention with great ardour to the study of phi-
losophy; and disdained with the opinions of Arilotti and
other ancient philosophers, because, as he says, he did not
find them conformable to the great volume of nature, he
imbibed the bold and free spirit of inquiry manifested by
Teleclus, in a work "On the Nature of Things," which
then engaged much attention in Italy. Accordingly he
published, at Naples, in 1591, a defence of this work in di-
flect opposition to the philosopher of Arilotti, under the
name of "Philosophia Senhbus demonstrata," or Philo-

CAMPANARIO, in Geography, a town of Spain, in
New Cuisine; 10 miles from Paluccio-del-Rey.
persecution by removing from Naples to Rome, and afterwards to Florence, Venice, Padua, and Bologna. At this latter place all his papers were clandestinely taken away and sent to the inquisition at Rome. At last he settled in his native country, and with a view of disguising his innovations, wrote in defence of the See of Rome. In 1599 he was suspected of entertaining hostile designs against the Spanish government, and of making himself master of the Higher Calabria; and committed to prison at Naples, under a charge of high treason. He was seven times subjected to the torture, and during his confinement he was, for a considerable time, debarred the privilege of reading and writing, and of all intercourse with his friends. Among other accusations alleged against him, he was charged with having written a book, entitled "De Tribus Imporibus," which, as he himself says, had been printed 30 years before he was born; when the rigour of his confinement was so far abated, that he was allowed to write and to correspond with his learned friends, he composed several books, which were published in Germany. Many attempts were made for his liberation; and, at length, in 1626, pope Urban VIII. prevailed upon Philip IV. of Spain, to acquit him from the charge of treason, and he was removed to the prison of the inquisition at Rome, where he was confined under a pretext of hereby till the year 1639, when he was finally liberated, after an imprisonment of about 30 years. The pope, who was a patron of learned men, in consideration of his sufferings, granted him a pension, together with the title of his domestic. But here he was still pursued by the resentment of the Spaniards, and, therefore, the pope warned him of his danger, and assisted him to make his escape to France, where he experienced the favour of cardinal Richelieu, who procured for him a pension from Louis XIII. At Paris he lodged in the Dominican convent of St. Honore, and was much respected by men of learning, who sought his conversation. This happy change in his situation was of no long continuance, for he died in 1639, as some have said, from the immoderate use of astrin-

Campanella was much more distinguished by the fertility of his imagination than by the soundness of his judgment. In this latter respect he was notoriously deficient, as many of his writings sufficiently evince. Beside the credit which he gave to the art of alchymy, and to a variety of supernatural cures, some of which referable to the Magnetifiers of a later period, he fancied that demons appeared to him, and in a state between sleeping and waking, warned him of any threatening dangers. But, notwithstanding the eccentricity of his genius, and his childish credulity, he had his lucid and happy intervals, in which he reasoned more soberly. The extent of his erudition appears from his numerous writings, and particularly from his treatise "De Refta Ratione Studendi," or, on the right method of studying; in which he pronounces judgment on a number of authors in philosophy, poetry, oratory, history, theology, medicine, and mathematics, and lays down excellent rules for the prosecution of philosophical studies, and the knowledge of nature, which he proposes to deduce from observation and experience. Many of his own opinions, however, on dialectics, physics, and ethics, were unreasonably abstruse, and expressed with great obscurity. Whilst it seems to have been his aim to recede as far as possible from the sylhetes of the Peripatetics, his own logic abounds with subtle distinctions, useless terms, and obscure rules, which are not easily comprehended. Concerning nature, his leading doctrines were, that sense is the only guide in philosophy; that space is the first incorporeal substance, immovable, and the receptacle of all bodies; that time is the succedaneous duration of things, and only measured by motion; that heat and cold are the two principles, which act on the mass of matter, the heavens having been produced by the former from rarified matter, and the earth by the latter, from matter condened; that the sun and earth are the two elements, whence all things are produced; that all animal operations are produced by one universal spirit; that all things in nature are endowed with feeling and perception; that the world is an animal or sentient being, inspired by a soul, by which it is directed, as man is by the divine principle within him; that the first, greatest, and only true being, in whom power, wisdom, and love exist as primary principles, transmits his inexhaustible ideas by means of the active causers, heat and cold, to the corporeal masses, supported in space, the basis of the world, which itself has its stability in God; that all creatures are excellent in proportion to the degree in which they bear the image of essential principles of the divine nature; and that human depravity confits in the loss of this image, and human perfection in its restoration. His works contain a variety of other articles, which are very fanciful and obscure. It redounds, however, in no small degree to the praise of Campanella, that he expoused the futility of the Aristotelian philosophy, and that he wrote an apology for Galileo, with a defence of his system. His acuteness in the science of politics is displayed in his "Political Aphorisms," and in his book "De Monarchia Hispanica;" but his principles resemble those of Machiavel. Whilst he professed to be a reformer in philosophy, he was delitute of that sober and found judgment, which was necessary for producing any very important and permanent effect. He was accused of impiety; but he seemed to have been rather a fanatical and enthusiastic than an atheist. He was also accused of suggeting cruel measures against the protestants, and, as Mosheim says, not without reason. Brucker's Hist. of Philos. by Enfield, vol. ii. p. 529. Mosl. Hist. vol. iv. p. 164.

Campanella, in Geography, a cape on the coast of Italy, nearly south from the city of Naples, across the gulf, of which it is the most fouthly point. The island of Creta lies to the west of it. See Creta.

CAMPANIA, now Campagna, in Ancient Geography, the most pleasant and fertile province of Magna Grecia, described by the ancients under the appellation of "Regio Felix." It extended from the N.W. to the S. E. along the Mediterranean; from the E. to the N.W. in Saturn, and from the S.E. by Lucania; and separated from Sannio by a chain of mountains. Its principal mountains were Melicus, Gaurus, and Vesuvius; its lakes were the Averno and Lucrinus; its rivers the Savus, Vulturnus, Clarian, and Silanus, which separated it from Lucania. Capua was considered as its capital; besides which it had several other considerable towns. See Campagna.

CAMPANIAN daisy, Murcus campanus, in Antiquity, is variously explained by modern writers. Some will have it only a sort of tuberces, or warts, on the face, to which the people of Capania were liable. Others maintain it to be the variegated daisy; and hence drew an argument against the supposed novelty of that malady. Dacier will have it to be something ill worse; the CAMPANIA, they are, were addicted to a sort of commerce too abominable to be named, ort morgi erant. Whence it is, Plautus represents them as more pathic or passive than the Syrians themselves. Hor. Stat. vi. lib. 4. ver. 62. cum not. Dacier.

CAMPANIFORM, or CAMPANULATE, in Botany, a denomination given to flowers in their form resembling a bell.

CAMPANILE, in Architecture. This word, derived from Campana, Ital. a bell, is particularly used to denote the bell towers which it is customary in Italy to erect, not like
The Lam. tent and Laith His, several tower remarkable, booki Andrew Turn. was (hepbut thofeof Bo* confiding divers. the Euclid, feet either s and this 14-9; iichucfo new the La iligma \plumb churches, At a wh lited in miwo, t 1. where •6j a them is half, lie each barbarous 1 Gen. blue, leaves 45 iiu-23x418•nf marble workman and the Giotto, the ing having cd tower, pania, tie feffor herd, he his created league, which the inhabitants of the latter place suffered, when it was besieged by his troops, he was deprived of his government; and withdrawing from the ecclesiastical state, he repaired to the court of Naples. But being disappointed of the preferment which he expected, he retired to Terrone, where he closed his life, in 1477. His various works, consisting of political and moral treatises, orations, letters, eight books of Latin poems, and the History of Andrew Broccio, were published by Michael Feron and a new collection of them was edited at Leipsic by Mencken in 1707 and 1734. Gen. Dict. Tiraboschi.

CAMPANO, Novarese, a distinguished Italian geometer and astronomer, flourished in the time of Urban IV., to whom he was chaplain, in the 14th century. He wrote Commentaries on Euclid, and he is said to have translated Euclid into Latin from the Arabic version; but Tiraboschi ascribes this translation to Adelard, an English monk. He also wrote a treatise on the quadrature of the circle.

Several astronomical works of his composition, which treat of the motions of divers planets, and the instruments necessary for observing them, on the ecclesiastical computation, and on the theory of the planets in general, exist in MS. in various libraries. Tiraboschi.

CAMPANOLEGIA, from campagna, bell, and servis, science, the art or science of ringing of bells.


Gen. Ch. Cal. perianth superior, five-cleft, Linn. Gaert. Lam. (in some species ten-cleft; five of the segments reflexed, and covering the capsule, Jull.) Cor. monopetalous, bell-shaped, five-cleft, thrivelling; segments broad, acute, spreading. Nectary in the bottom of the corolla; composed of five, acute, connivent valves, covering the receptacle. Stam. five, capillary, very short, inserted on the tips of the valves of the nectary; anthers longer than the filaments, erect. Pifg. germ inferior, angular; style thread-shaped, generally longer than the filaments; stigma two, three, or five-cleft, oblong, thickish; segments revolute. Peric. capsule inferior, angular; either top, egg, or prizm-shaped; two, three, or five-celled; in most species emitting the seeds at as many lateral holes as there are cells; in a few, opening by valves. Seeds numerous, small, adhering to a columnar receptacle. Eff. Ch. Cor. bell-shaped, closed at the bottom by valves bearing the filaments. Stigma two, three, or five-cleft. Capsula inferior; two, three, or five-celled.

Obj. What Linnaeus calls the valves of the nectary are considered by Gagnier, Jussieu, and La Marek, simply as connivent dilatations of the filaments, forming a kind of vault over the receptacle. Dr. Smith drops the idea of a nectary, and says, that the bottom of the corolla is closed by flaminiferous valves.

* Calyx five-cleft. Capsulae top or egg-shaped.
† Lister almost smooth, not harsh to the touch.

blue, terminal, large in proportion to the size of the plant; calyx rough, with short, white hairs. A native of the Alps about mount Cenis, introduced into England in 1755, by Dr. Fothergill and Dr. Pitcairn. 2. C. ciliata, Willd. 38. Mart. 67. Lam. Illust. 2490. Allion. Ped. n. 357. Tab. 7. fig. 1. "Stem one-flowered, nearly naked; leaves smooth, oval, toothed; calyx smooth." Root perennial. Stem about three inches high, round. Root-leaves numerous, petiolated, deciduous, acute, nerved beneath. Calyx close on the middle. Corolla spreading. Found by Allioni at the foot of mount Vefudo in Piedmont. 3. C. bellardii, Wild. 3. Mart. 68. Lam. Illust. 2491. Allion. Ped. n. 356. Tab. 85. fig. 7. "Stem one-flowered, nearly naked; leaves petiolated, elliptic lanceolate, toothed." Root perennial. Stem six inches high, round. Root-leaves oblong-egg-shaped, obtuse; stem-leaves longer, lanceolate-linear. Flower blue, terminal, nodding. The whole plant slightly hairy. A native of mountains in Lapland. 5. C. pedata, Linn. Sp. Pl. 38. Willd. 82. Mart. 53. Lam. Enc. 5. Illust. 2493. Mor. hist. 2. p. 466. Sect. 5. Tab. 2. fig. 18. Flor. Dan. Tab. 330. bad. Eng. bot. 73. "Leaves heart-shaped, five-lobed, petiolated, smooth; stem flaccid." Root perennial, fibrous, small. Stems procumbent, creeping, wide spreading, slender, branched, smooth, leafy. Leaves opposite or alternate, tender, smooth, with the exception of a few scattered hairs. Flowers pale blue, terminal and axillary, nodding, some withering after they are gathered. Cutifolia small, hemipetalous. A native of England, Denmark, France, and Spain, in moist shady places. Linneas, without sufficient reason, supposes it a hybrid plant, from some campanula impregnated by Veronica ledifolia. 6. C. echinata, Linn. Lam. Enc. 4. Illust. 2494. Wildl. 73. Barcel. t. 454. "Stems simple, one-flowered; root-leaves roundish-heart-shaped, falcate, on long petiole; stem leaves smaller, from the base spatula-shaped, acute; flower drooping." Stem three inches long, leafy, simple, weak. Root-leaves numerous, smooth, scarcely four or five lines broad. Flowers blue; calyx very short, with five acute teeth. A native of the Italian Alps. 7. C. blattina, Linn. Sp. Pl. 37. Wildl. 86. Mart. 52. Lam. Enc. 5. Illust. 2495. Allion. Ped. n. 422. Tab. 7. fig. 1. Barcel. t. 453. "Leaves heart-shaped, toothed, pubescent, petiolated; stems prostrate; peduncles capillary, many-flowered." Root perennial. Stems many, generally simple, round, pubescent, springing from the fissures of rocks. Leaves alternate, on long petiole. Racemes axillary, with about three flowers, sometimes branched. Flowers purple, cleft half way down; segments lanceolate, revolute. All the flowers have a linear bracteae except the upper one. The whole plant is very milky and pubescent, with short hairs. A native of Piedmont at the foot of the Alps. 8. C. pulia, Linn. Sp. Pl. 2. Wildl. 4. Mart 3. Jacq. Obs. 1. p. 32. Tab. 18. Aug. 3. Tab. 28. "Stems one-flowered; stem-leaves egg-shaped, falcate; flower drooping." Root perennial, small, creeping. Stems five or six inches high, slender, upright, zigzag; sometimes having one or two flowering branches, each with a single flower. Root and stem-leaves egg-shaped, obtuse, petiolated. Flower deep blue, terminal, calyx smooth. There is a variety with roundish leaves, and more than one flower. A native of mountains in Austria, Stiria, and Aragon. 9. C. rotundifolia, Linn. Sp. Pl. 3. Wildl. 12. Mart. 4. Lam. Enc 5. Illust. 2498. Curt. Flora. Lond. 4. 12. Eng. Bot. 876. "Root-leaves kidney-shaped; upper leaves linear." Root perennial, branched, somewhat wavy. Stems several, from two or three inches to a foot or more in length, rather upright, but weak, round, smooth, milky, branched. Leaves smooth; root-leaves petiolated, generally toothed, but sometimes quite entire; stem-leaves near the base. Lacunato and toothed; near the summit linear and entire. Flowers blue, sometimes white, nodding; segments of the calyx linear, lanceolate, grooved, expanding horizontally when out of bloom; valves of the minute fringed, pointed, white. The root-leaves from which this species, rather inconveniently, and, indeed, somewhat improperly, takes its name, are seldom observed, being usually concealed among the surrounding grass and leaves of other plants, and withering away as the plant advances to maturity. The juice of the flowers being blue, but, with the addition of them, produces a green pigment. It varies to much from foul and putrescent, that authors differ greatly from each other with respect to what are only varieties, and what are really distinct, though kindred species. Willdenow affirms, that C. rotundifolia of Allioni, (Flor. Ped. n. 98. Tab. 47. fig. 2.) quoted by Martyn, is certainly a distinct species, since it appears, from Allioni's figure, to be very different from rotundifolia of Linneas in the form both of its leaves and of its corolla. La Marec speaks of a variety which he has found in Auvergne, which differs in habit from rotundifolia, but, upon examination, is found to resemble it in all its botanical characters, except that its stem-leaves are long lanceolate, and narrowed into a petiole at their base. 10. C. pedata, Curtis, Bot. Mag. 511. (rotundifolia B. Linn. Minor rotundifolia alpina, Balb. pred. 34. C. pulia, Jacq. 2. p. 79?) C. eschiffana, Linn. Ill. 2497. Enc. C. pulia, y. "Root-leaves egg-shaped, falcate; petioles flattened; flowers in unilateral racemes, drooping." A plant of much humbler growth than rotundifolia. Root-leaves never kidney-shaped; on short, flattened, not thread-shaped, petioles; continuing during the time of flowering, and forming a mat, not disappearing like those of the preceding species; lower stem-leaves often of the same shape. It bears a profusion of flowers, and being a biarly perennial, is particularly fitted to adorn rock-work. There is a variety with white flowers. According to Curtis, the eschiffana of Scopoli (n. 225. Tab. 4.) is probably a variety. Professor Martin has taken it up as a distinct species, though he had before quoted it as a synonym under C. rotundifolia B. Linn. the pumila of Curtis. Villars, dauph. 2. 500. Hall. hist. n. 702. Balh. Pred. 34, are also quoted by him under both. 11. C. gargyfiola, Lam. Illust. 2469. "Stems many-flowered; lower leaves lanceolate, egg-shaped, petiolated; stem-leaves narrow, acute, seifed." A native of the south of France. La Marec affirms that though nearly allied to rotundifolia, it is distinct, and refers to Gimch, Sib. tab. 33. 12. C. fabriana, La Marec Illust. 2500. (Uniflora, Vill. Dauph. 2. p. 500. tab. 19. Linaria, Wildl. 113?) "Lower part of the stem somewhat hairy; lower leaves egg-shaped; upper ones narrow-lanceolate; flower terminal, erect. Small abortive flowers are found in the axile of the upper leaves." There is a variety entirely hairy, which La Marec conjectures may be C. valdensis of Allioni (Flor. Ped. n. 400. Tab. 6. fig. 1.) The valdensis is taken up by Martin as a distinct species; and C. Schneucherii of Villars (Dauph. 2. 501. tab. 193. taken up from Schleich. t. 454. tab. 14. fig. 1.) is quoted as a synonym. Willdenow supposes the valdensis of Allioni to be his limolcis, and C. Schneucherii a variety.
17. C. palentus, Willd. 11. Schmidt. Bohem. n. 167. "Stem hairy; leaves smooth; root-leaves heart-shaped; stem leaves oblanceolate, toothed, petiolated." Root perennial. Stem decumbent, angular. Flowers short, broad. A native of rocky woods in Bohemia. 14. C. bulbifera, L. Marck. Enc. 8. Ill. 2501. "Smooth; stem erect, many-flowered; leaves all sessile; the lower ones egg-shaped; upper ones lanceolate-linear." Stem about a foot high, simple, smooth. Leaves almost entirely smooth; upper ones entire, acute, a little obovate, rosy, glaucous. Bractes. 1. Forster upwards, terminal; their tube shorter than the calyx-segments. Stem a foot or more high, leafy, two-edged. Leaves obtuse; lower ones opposite, the soft felted. Flowers erect, on long peduncles; calyx globose, generally rough with deflexed bars, but in Forster's original specimen smooth; segments awl-shaped, longer than the body; corolla slender, funnel-shaped, of a rich blue within, paler without; segments acute, fringed, sometimes only four. Capsule three-celled, three-valved at its summit. Every part of the herbage rough with a short rigid pubescence. Found by Forster in New Zealand and New Caledonia, raised in England from seeds brought from New South Wales. 21. C. vincifolia, Venten. Jard. de Malmaison. 12. (Camp. gracilis, Bot. Mag. 667.) "Leaves lanceolate-lanceolate; stem round, much branched; peduncles terminal, elongated, one-flowered." Ventenat supposes his plant and the gracilis of Forster to be the same. Dr. Sims (Bot. Mag.) concurs with him; and there is certainly nothing in the specific character, as given by Ventenat, which can lead to a different opinion; but we have kept them separate, in deference to the judgment of Dr. Smith, who thinks the vincifolia a distinct species, being smooth, except some scattered longish bristles on the leaves; and having a wider flower, with much shorter calyx-segments, and a less globular capsule. The figures in Exotic Botany and the Botanical Magazine are materially different. We have referred that in the latter, though with some hesitation, to Ventenat's plant, on account of its widespread campanulate, not funnel-shaped, flower, which appears of itself to form a sufficient specific distinction. The teeth, or, as we should rather call them, segments of the calyx, are represented in the Botanical Magazine expanding, which would form another good difference, if Dr. Sims had not in the description expressly stated them to be erect. The smoothness of the leaves is too variable a character to be of much value. Dr. Smith says that the capsule of vincifolia is less globular than that of Sims's; but in the Botanical Magazine it is evidently more so. Dr. Sims's description differs in several respects from Dr. Smith's. We shall transcribe the most material parts, that future observers may be better able to determine the identity or the diversity of the species. Stem square, hairy, generally decumbent. Leaves mostly opposite, toothed, somewhat pubescent. Flowers nodding whilst in bud, erect when expanded; on long, square, hairy peduncles; calyx egg-shaped, fringed; teeth awl-shaped, erect, dilated; corolla bell-shaped, cut half-way down into five, sometimes only four, egg-shaped, entire segments; nectaries or valves three-lobed; anthers oblong, disapparing almost as soon as the flower opens; style erect; stigmas three, rolled back, villous. First raised by Mr. Curtyis, by fowing the mould that came about the roots of some plants imported from New Holland and New Zealand. It flowers during the greatest part of the summer, and is easily propagated by seeds or cuttings. 22. C. Rapunculus, Rampon. Linn. Sp. Pl. 5. Willd. 23. Mart. 6. Lam. Enc. 10. Ill. 2524. Gært. tab. 31. fig. 2. Eng. Bot. 283. (Rapunculus cneifer, Rau. Syn. 277.) "Leaves waved; root-leaves lanceolate-oval; panicle contracted." Root biennial, spindle-shaped, white, sweet, efflucent. Stem a foot and half
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or two feet high, erect, angular, rough, especially on the lower part with deflexed hairs. Leaves alternate, sessile, toothed; lower ones rather hairy; upper ones smooth. Bracts awl-shaped. Panicle erect; its side branches bearing from one to three or more flowers. Flowers bluish purple, or whitish; segments of the calyx sometimes toothed, but not so much as in petula; corolla inflated, not tapering at the base; nectary fringed. Capsule crowned with the lanceolate-linear segments of the calyx, retuse, ineruptly pyramidal-egg-shaped, with three nerves on each of the three blunt angles opening with three lateral holes, a little above the middle. Seeds numerous, small, elliptical, lenticelately compressed, smooth, shining, of a pale rufous colour. Smith and Gardiner. A native of France, Switzerland, Germany, Piedmont, &c. It has been found in England, about Croydon and Ether in Surrey, old Buckenham castle in Norfolk, and Enville in Worcestershire. The leafy roots and the young leaves are eaten in France in salads, and are thought to increase the milk in nurses. The roots are also eaten boiled. It was formerly much cultivated in England as an eculent, but is now neglected. In the time of Parkinson its roots were boiled till they were tender, and afterwards eaten cold with vinegar and pepper. 25. C. periclymena. Lam. Sp. Pl. 6. Wild. 29. Mart. 3. Lam. Enc. 11. Ill. 2605. (Rapunculus periclymena, Bauh. P. 93.) "Root leaves ineruptly egg-shaped; stem leaves lanceolate-linear, somewhat serrated, sessile, remote." Root perennial, eculent. Whole plant, except the germ and capsule, smooth. Stem two or three feet high, erect, simple, angular. Stem leaves straight, acute, distant, slightly toothed. Flowers in a thin spike, blue, sometimes white, on long peduncles; corolla large, broad, short; bracts two to each peduncle. There is a variety found in low woods, with only two or three large flowers, and long narrow leaves. A double variety, both blue and white, is also common in gardens, called, in some parts of England, Batchelor's Buttons. A native of moist parts of the continent of Europe. A magnificent, large-flowered variety from South Carolina, imported by Mr. Dickson of Covent garden, and differing from the European plant only in size, is figured in the Botanical Magazine, 357. It is very hardy and easy of culture, increasing by its roots, which are somewhat creeping, and may be parted either in spring or autumn. 24. C. pyramidalis. Lam. Enc. 12. Ill. 2566. Town. Cor. 4. "Leaves all linear, toothed; stems simple; flowers erect, sessile." Stems scarcely a foot high, smooth. Leaves scabrous at their edges with fine spinous teeth. Flowers alternate, blue, forming a spike at the upper part of the stem; calyx short, smooth; corolla oblong, slightly five-cleft: bracts three. Observed by Tournon in Armenia. 25. C. linarioides. Lam. Enc. 15. Illus. 2507. Wild. 15. * Stem rod-like, panicked: leaves linear: flowers erect, terminal." General habit that of Arrhirrhina linaria. Stem about a foot high, slender, smooth, slightly frayed, panicked at the top. Leaves numerous, scattered, minute, with a few, feebly perceptible teeth. Flowers peduncled, small: corolla deeply divided. Found by Commeron on Monte-Video, near Buenos-Ayres, in South America. 26. C. pyramidalis. Lam. Sp. Pl. 17. Wild. 27. Mart. 28. Lam. Encyc. 14. Ill. 2508. (Rapunculus botroennis: Bauh. p. 93.) "Leaves smooth, even, serrated, heart-shaped; stem leaves lanceolate: stems rush-like: simple: umbels sessile, lateral." Root biennial, oblong, fibrous, milky. Stems several, near four feet high, smooth. Leaves petioled. Flowers blue, sometimes white, large, open, coming out several together in lateral and terminal tufts or umbels, on short peduncles: segments of the calyx upright, linear. Vigorous plants throw out numerous simple, short, lateral branches. A native of Carniola. It is sometimes cultivated in a pot, and let on the hearth of halls, &c. in summer, and by spreading the upright stems on a flat frame composed of flender laths is formed into the shape of a fan, which will nearly cover a common fire-place. 27. C. americana. Linn. Sp. 3. but not the synonyma which belong to the next species. Wild. 28. Mart. 9. Hort. Kew. 250. "Leaves heart-shaped and lanceolate: petals ciliated: flowers unilateral: corolla five-cleft, flat." Linn. "Leaves heart-shaped and lanceolate, serrated: petals of the lower ones ciliated: flowers axillary, sessile: corolla five-cleft, flat: style longer than the corolla." Hort. Kew. Root annual. Stem and germs smooth. Flowers three or four from the axil of each leaf or bract: corolla small. Linn. A native of Pennsylvania, introduced into England in 1763, by Mr. J. Bartram. 28. C. nitida. Wild. 29. Mart. 74. Hort. Kew. 221. L'Herit. &c. Ang. (C. planifolia, Lam. Enc. 15. Ill. 2509. C. minor Americana, Herm. Lugd. 107. Trachelium minus Americana: Doddart. Mem. 4. p. 119. tab. 118.) "Leaves oblong, scoloped, even: stem leaves lanceolate, nearly entire: corolla bell-wheel-shaped. Hort. Kew. "Leaves oblong, scoloped, rigid, sessile: flowers erect, flat." Lam. Root perennial. Stems five or six inches high, often simple, straight, stiff, a little striated. Stem leaves smooth, green, gradually diminishing to the top of the stem. Flowers blue or white, one or two in each axil of the upper leaves: calyx short: segments oval-acuminate. La Mark doubts whether it be specifically distinct from C. americana, though he acknowledges that it differs from it in having no heart-shaped leaves, nor ciliated petals: and in the flowers not being unilateral: the last circumstance, however, is omitted in the specific character of C. americana, drawn up for the Hortus Kewensis. A native of America, described by La Mark from a living plant in the royal garden at Paris. 29. C. flybya, Lam. Enc. 16. Ill. 2512. Wild. 35. Smel. Sib. 3. tab. 27. good. "Leaves petioled, somewhat heart-shaped, acutely serrated: flowers small, nodding, style longer than the corolla." Stem a foot high or more, simple, and, like all other parts of the plant, smooth. Leaves scattered, acuminate, decurrent along the petiole with a flight membrane: bracts lanceolate and nearly sessile. Flowers oblong, blue, in a terminal panicle: border obtruse: style very long: stigma club-shaped, slightly three-cleft. A native of Siberia, sent to the royal garden at Paris, under the name of C. lilifolia. 30. C. periclymena. Lam. Enc. 17. Ill. 2511. "Leaves heart-shaped, obtusely serrated, on long petioles: stems ascending, few-flowered." Referring the preceding, but smaller, and not with upright stems. Leaves all petioled, acuminate, smooth, a little toothed or scoloped. Flowers terminal, pale blue, resembling those of C. flybya. A native of Siberia, cultivated in the royal garden at Paris. 31. C. lilifolia. Linn. Sp. Pl. 9. Wild. 30. Mart. 27. Lam. Enc. 18. Ill. 2512. Amm. Ruth. p. 11. n. 17. Smel. Sib. 3. p. 143. tab. 25. "Leaves lanceolate: stem leaves acutely serrated: flowers purplish, nodding." Root perennial. It varies in its form and size, and in the number and colour of its flowers; but may in all cases be distinguished from the two immediately preceding by its sessile stem leaves. A native of Siberia, from the laick eastward to the confines of China. The roots are eaten by the inhabitants boiled and raw. 32. C. azurea, Bot. Mag. 551. Southern MSS. in the possession of Sir Joseph Banks. "Leaves oblong, egg-shaped, sessile, serrated: stem simple, angular: flowers panicked." Sol. Root perennial. Stem erect, quadrangular, with raifed, somewhat cartilaginous angles. Root leaves.
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linear-awl-shaped, entire; flowers axillary, solitary, sessile."


Leaves hard to the touch. 57. C. flore, Willd. 7. Mart. 67. Thunb. fl. jap. 88. "Leaves sessile, egg-shaped, ferrated, glaucous beneath; stem angular, panicked; peduncles one-flowered." An under-fermat. Stem two feet high, erect, smooth; branches erect, zigzag, somewhat fimbriate, angular, smooth. Leaves scattered, acute, a little reflexed at the edge, scabrous, netted; lower ones larger, expanding, upper gradually less, erect, about an inch long. Flowers axillary on the upper part of the branches; peduncles an inch long, erect; branches one or two on a peduncle, alternate, lanceolate, resembling the leaves; calyx somewhat angular, glaucous; segments lanceolate, reflexed; corolla large, blue. 58. C. nigricana, Willd. 44. Mart. 66. Thunb. jap. 89. "Leaves lanceolate, waved, erect, ferrated, bordered; branches weak; flowers terminal, solitary. Stem thick at the base, rather woody, decumbent; branches numerous, about four inches long, capillary, rather erect, a little subdivided, ferrated, smooth. Leaves on the lower part of the branches half an inch long, sessile, alternate, white edged, hispid with white hairs. Flowers terminal, solitary. The last four were observed by Thunberg in Japan. 59. C. paniculata, Linn. jun. Supp. p. 139. Willd. 50. Mart. 59. Thunb. Prod. 39. "Leaves lanceolate, waved, hairy; stem angular, hispid; flowers in racemes." Stem herbaeous, panicked; branches disarticulate. Leaves entire. A native of the Cape of Good Hope. 60. C. latifolia, Giant thrift-vort, Linn. Sp. Pl. 11. Willd. 33. Mart. 22. Lam. Enc. 25. Ill. 2526. Eng. Bot. 302. "Leaves egg-lanceolate; stem quite simple, nearly round; flowers solitary, peduncled; calyxes smooth; fruit drooping." Root perennial, milky. Stem three or four feet high, erect, slightly angular, somewhat hispid, many-flowered. Leaves large, alternate, nearly felise, roughish, doubly ferrated. Flowers large, blue, sometimes white, axillary, almost always solitary, erect; calyx smooth, ferrated, alternate of Sweden, and other parts of Europe; common in Scotland and the north of England, rare in the south. It is sometimes cultivated in gardens. 61. C. articulata, Willd. 54. Schmidt. 1775. "Stem angular, hispid; upper leaves egg-lanceolate, costely ferrated; peduncles one-flowered, axillary, drooping; calyxes hispid." It differs from the preceding, chiefly in its hispid calyxes, but its stem is also more hispid, and has more prominent angles; its root and lower sternal leaves are also heart-shaped, and in that respect approach more nearly to C. trachelium. A native of shady places in Germany and Bohemia. The articulata of Allioni (flor. pedem. n. 406.) taken up by Professor Martyn n. 723, seems a different plant, which ought to be placed with a new specific name in the preceding subdivision. It is thus characterized: "Stem roundish, simple, upper leaves felise; spike unilateral; peduncles one-flowered; calyxes smooth." Plant entirely smooth. Stem three feet high, broken. Leaves soft, egg-lanceolate, unequally and sharply toothed. Flowers finge, axillary, on short peduncles towards the top of the stem, with linear bracts; calyx five-cleft beyond the middle; segments narrow, not reflexed; corolla and calyx nearly equal. A native of Italy in woods. After all, the plants of Schmidt and Allioni are nearly allied to each other, and seem to differ chiefly in the comparative length of the calyx and corolla. Both of them may, perhaps, be not improperly considered as varieties of C. latifolia. Characters drawn
drawn from the smoothness or roughness of the leaves, though they often afford a good and always an obvious distinction, and on that account make convenient subdivisions in a large genus, are sometimes fallacious, and can seldom be opposed to each other with rigid exactness. 62. C. Tinctoria, nettle-leaved threath-wort, Linn. Sp. Pl. 16. Willd. 41. Mart. 23. lam. Enc. 26. PI. 5257. Eng. Bot. 12. "Stem angular; leaves lanceolate-heart-shaped, bluntly serrated; calyxes hispid; peduncles axillary, few-flowered." Root perennial. Stem two or three feet high, thick, hispid. Lower petioled, deeply and markedly serrated; bracts tough, generally hispid with purplish hairs. Bristles violet-coloured, rather less than those of C. hithofia; sometimes three, but more frequently only one on a peduncle; calyx hispid at the base and on the edge, but sometimes smooth. A native of many parts of Europe; common in the fourth, but rare in the north of England. 63. C. rapunculoides, Linn. Sp. Pl. 13. Willd. 50. Mart. 27. lam. Enc. 27. II. 2528. Eng. Bot. 1379. "Leaves lanceolate-heart-shaped; stem branched; flowers scattered, unilateral, nodding; calyxes reflexed." Root perennial, creeping. Stem about a foot high, more or less branched, round, rough with deflexed hairs. Leaves feathery; lower ones petiolated, lower ones sessile. Flowers blue, axillary. Caffale resembling that of Rapunculus, but only half as large. Segments of the calyx linear, reflexed. Openings large at the very base of the capsule. Seeds elliptical, so much compressed as to be almost flat, plain on one side, marked with an elevated longitudinal line on the other, of a yellowish brown, scarcely shining. Gaert. A native of Switzerland, France, and Austria; rare in great Britain, but, as appears from Buddle's herbarium, gathered among ivy trees in same woods in Oxfordshire, and found, apparently wild, by Dr. Skirrhine at Blair in Scotland. 64. C. boveiensis, Linn. Sp. Pl. 15. Willd. 57. Mart. 24. lam. Enc. 28. II. 2529. "Leaves egg-lancolate, feathery beneath, sessile; stem pinnacled." Root perennial, large, woody. Stem with the habit of verbacum nigrescens, three feet high or more, erect, rough. Leaves feathery, almost heart-shaped, slightly toothed, covered with white hairs beneath. Flowers violet-colour, terminating the branches in a kind of spike; axillary; lower ones three together, on short peduncles; upper ones five, sometimes two, flaccid, white, native of Italy, Corsica, and Sardinia; introduced into England in 1772 by John Earl of Rute. 65. C. germiinfolius, Linn. Sp. 14. Willd. 42. Mart. 25. lam. Enc. 29. II. 2532. "Leaves linear-awl shaped; head terminal." Root perennial, divided at the crown into several trunks, each producing a tuft of straight, long, grasslike leaves, elating at their base. Stems simple, scarcely longer than the root-leaves. Stem-leaves alternate, rather embracing the stem. Flowers blue, five or seven together, in a head; bracteae egg-shaped, acuminate; figimina two-cleft. 66. C. glomeratus, little Canterbury bells, Linn. Sp. Pl. 17. Willd. 42. Mart. 29. lam. Enc. 30. II. 2531. Eng. Bot. 92. "Stem angular, simple; flowers sessile; most of them collected into a head, a few solitary, and axillary within the upper leaves; leaves egg-shaped, scapellate." Root perennial, woody. Stem a foot high, erect, roundish, rather rough, seldom if ever branched, unless first erect down by cattle. Leaves hairy, pale beneath; root-leaves a little heart-shaped, on long petioles; stem-leaves half embracing the stem. Flowers blue, purple, or white. A native of lime-borne and chalky soils in England, France, and other parts of Europe. 67. C. petraea, Linn. Sp. Pl. 28. Willd. 46. Mart. 32. lam. Enc. 31. II. 2532. Bar. ic. 890. (Trachelium majus petraeum; Pon. bald. 161.) "Stems simple, rough; leaves oblong-egg-shaped, hairy, sessile; head terminal." Nearly allied to the preceding, but more hairy. Stem one or two feet high, erect, rough. Leaves all oblong, harsh, deep green above, whitish and cottony beneath; stem leaves not half embracing the stem. Found on the summit of Mount Baldo; a native also of Piedmont, Lidia, &c. 68. C. Ceratocory, Linn. Sp. Pl. 16. Willd. 3. Mart. 30. lam. Enc. 32. II. 2533. "Hispid; flowers sessile; head terminal; leaves lanceolate linear, waved, scapellate." Root biennial, seldom. Stem about a foot high, simple, or a little branched. Leaves heart-shaped, linear, rough with hairs. Flowers blue or white, most of them in a head, a few axillary. A native of woods on the continent of Europe; introduced into England in 1785 by Dr. Percussion. 69. C. hygidae, Linn. Sp. Pl. 17. Willd. 42. Mart. 31. lam. Enc. 33. II. 2534. "Hispid; raceme oblong egg-shaped, terminal; stem quite simple; leaves lanceolate linear." Root biennial, large, woody. Stem eight or ten inches high, erect, rough with white hairs. Root leaes tufted, round, laciniate egg-shaped. Stems leaves numerous, upright, scattered, hairy, a little harsh to the touch. Flowers yellowish white, very numerous, densely disposed in a kind of thyrsus; corolla hairy. A native of Austria, Switzerland, and the south of France. 70. C. Launfinaea, Linn. Enc. 34. II. 2535. (C. peregina; Linn. Mast. Willd. 52.) "Hispid launfinae; leaves egg-shaped, wrinkled, scapellate, narrowing into a petiole; stem simple; flowers nearly sessile, erect, open." Stem a foot high, erect, round thickly covered with separate white hairs. Root-leaves rough on both sides, pale green above, white beneath, a little resembling those of the primrose; stem-leaves smaller, alternate; the upper ones sessile and rather acute. Flowers lateral and terminal, solitary, blue, calyx hispid, a little shorter than the corolla; segments lanceolate; corolla short, very open; style not longer than the corolla; stigma three cleft. Cultivated for a long time in the royal garden at Paris, and reputed to be a native of Tartary. The peregina of Linnaeus springing up in ground town with feeds from the Cape of Good Hope, but it was probably mixed with them by accident. 71. C. tomentosae, Linn. Enc. 35. II. 2536. (C. foliis profunde inicinis, tomentosa tata & eana; Tourn. Cor. 3.) "Root-leaves long, spatulate-flaped, scapellate; upper ones wedge-shaped; flowers peduncled, somewhat falked; calyx downy." The whole plant covered with a fine white down. Stem round. Flowes oblong, in a loose, fimbriated unilateral spike, on short peduncles; calyx half the length of the corolla. Described by La Marec from a dried specimen in the herbarium of Jussieu. Native country unknown. 72. C. argentea, Linn. Enc. 36. II. 2537. (C. leucocolistour; Tourn. Cor. 3.) "Leaves oblong, narrow, silvery-white with down; stem pinnacled: branches one-flowered." Stem three or four inches high. Root-leaves numerous, a little enlarged towards their summit, scarcely an inch long, entire. Stem-leaves almost linear. Flowers terminal. A native of Armenia, preferred in the herbarium of Jussieu. 73. C. calaminifolia, Linn. Enc. 37. II. 2538. (C. saxatilis, foliis crenatis & velutini rugosis; Tourn. Cor. 3.) "Pubescent: stem branched, decumbent; stem-leaves roundish egg-shaped, scapellate, nearly sessile; thole on the branches small, acute; corolla pubescent on the outside." Stem scarcely a foot long. Stem leaves spatulate-flaped, like those of the daily. Flowers terminating and axillary; corolla a little tubular. Found by Tournelort in the island of Naxos; described from a dried specimen in the herbarium of Jussieu, and an original drawing by Aubriet. 74. C. hispidula, Linn. jun. Supp. p. 142. Willd. 49. Mart. 27. lam. Enc. 40. II. 2542. "Hispid: flowers erect; calyx the length of the corolla." Root annual. Stem about four inches high, branched, especially.
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*** Calyx five-ribbed: capsules elongated, prism-shaped. (Prismato-carpus: l'Hert. legousi: Durande.)


synonym to our carpatica, n. 55. We have not Jacquin’s work at hand, but this plant cannot be the carpatica of the English gardens figured in the Botanical Magazine, which has a five-cleft calyx, with the segments a little reflexed, but not alternate ones, covering the calyx as in all the species of this division; whereas La Marek describes the calyx of his violaceus to be, a cincdecoupes lanceolées, et à fines reflechoes, the expression by which he uniformly denotes what we call the five alternate reflexed segments.

Has he been led into an error by the ambiguous phrase calyx reflexo in the definition of the younger Linnaeus? It is, the present species must be expunged. He appears to have formed his description only from a dried specimen in the herbarium of Jussieu. 105. C. heterophylla, Linn. Sp. Pl. 39. Wild. 84. Mart. 55. Lam. Enc. 54. Ill. 2561. (C. faxsithis, folis inferioribus Bellidias, ceteris Nummularis, Tourn. Cor. 3. I. 1. tab. 243.) “Leaves indivi
dersely egg-shaped, scollopeld, on long petiolo. Stem-leaves lanceolate-egg-shaped, attenuated and gasted at the base; flowers pustuled.” Stem about a foot high, round, slightly pubescent. Flowers small, numerous, in terminal panicle. A native of the Levant. 107. C. fruticosa, Lam. Enc. 57. Ill. 2564. (C. folis profoundé lacinis; fructu duro, Tourn. Cor. 3.) “Hilipid; root-


Propagation and Culture. Such of the species as come from the Cape must be kept in the dry loose, and treated like the other plants of the same climate; they may generally be increased from cuttings. Most of the others are hardy plants, which bear the open air, and will thrive in almost any situation. Those that are annual are usually found in the spring, in the borders of the flower garden; but, if in flower in the preceding autumn, they will be stronger and flower a month earlier. The perennial ones are easily propagated by parting the roots in autumn, but where this practice is long continued, the plants are apt to degenerate, and at length seldom produce seeds. It is desirable, therefore, to raise a succession of seeds, which will produce plants that are more vigorous, and bear a greater profusion of flowers. The pyramids, in particular, is seldom fit to adorn halls and chimneys for two successive seasons. In order to procure good seeds, strong plants should be selected which grow in a warm situation, and which have been screened from great rains at the time when their flowers were fully open. The seeds should be sown in autumn in pots and boxes filled with light undoubted earth; and in the winter should be sheltered from severe frosts under a hotbed frame. In summer, they must be kept clear from weeds, and moderately watered in very dry seasons. In September, when the leaves of the plants begin to decay, they should be transplanted into beds of light sandy compost, without any mixture of dung, and care should be taken not to break or bruise the roots. They should be set about four inches from each other, and in two years will be strong enough to flower. The Rampion, when it is cultivated for the table, should be sown in a sandy border about the latter end of May, and in the course of the summer should undergo three hoings to cut up the weeds, and thin the plants to the distance of three or four inches. The roots are fit for use in the winter, and will continue good till April. If the seeds are sown too early, the plants are apt to flower the same season, by which the roots are always spoiled. See Martyn’s Miller.
This kind preys on the marine eel, crabs, and other small creatures, and is chiefly observed in autumn. Its body is of a conic-oval form, with the fringe, and hairy crofs of a yellow colour, and sometimes white; beneath bottom and yellow white.

CAMPANULACEÆ. In Botany, the fourth order of the tenth clafs of Jullien's natural orders, focoled from their affinity to the genus Camp Sullivan. Jullien gives them the following character. Calyx superior, sometimes but rarely half inferior; border divided. Corolla inserted on the upper part of the calyx, most frequently regular, generally thralling; border divided. Stamens inserted under the corolla, as many as its segments, and generally alternating with them, most commonly five; anthers either distinct or united. Gyno-glandular above; style one; stigma either simple, or divided. Capsule most commonly five-celled, but in some cases two, five or six-celled, often many-seedeed, and generally opening at its sides. Seeds fixed to the interior angle of the cells. Seeds generally herbaceous, but sometimes thorny; milky. Leaves most frequently alternate. Flowers distinct, or in a few instances aggregate, and enclosed in a common calyx. Jullien includes in it, Ceratocaula, Fordegif, Minduin, Cannania, Campuran, Trachchum, Rodella, Gepserica, Cyphia, Seveola, Phytceum, Lobula, and Jaffone. According to Ventenat, its genera are Melanthia, Canarina, Campuran, Trachchum, Rodella, Phytceum, Seveola, Gooden, Lobula, and Jaffone. His Micranthus is the Minimus of Jullien.

CAMPBELL, Archibald, in Biography, the descendant of an ancient and noble family in Scotland, was born in the year 1581: and having been educated in the profession of the protestant religion, according to the strictest rules of the church of Scotland, as it was setted immediately after the reformation, he zealously supported that church, and the constitution of his country, according to the ideas which he had formed of its legal establishment. In the earlier period of his life, he avoided his attachment to the king, and was distinguished by marks of royal favour. At the commencement, and during the progress of the rebellion, he seems to have maintained his loyalty; and after the establishment of the commonwealth his country was the last that submitted, and even then, his son did not subside. At length, Argyle himself, who had been created marquis in 1640, was induced, by the prevailing circumstances of the times, and the authoritative interferences of general Monk, to yield to the ruling powers. After the restoration, he was tried for his compliance, under a charge of treason, and sentenced by the parliament of Scotland to be beheaded. During his trial, he behaved with great firmness and dignity: and on the scaffold manifested the integrity of a man, or rather, as he wrote of his life says, the constancy of a Christian, affecting the uprightness of his conduct, and the sincerity of his affection both to King Charles I. and King Charles II. As to his character, Mr. Hume (1718. vol. vi. p. 272) represents him as a man equally supple and inflexible, cautious and determined, and entirely qualified to make a figure among a faction and tumultuous period. Bio. Brit.

CAMPBELL, ARCHIBALD, earl of Argyll, son to the former, was educated under his father's eye, in the true principles of loyalty and of the Christian religion, and distinguished himself, in an eminent degree, by his personal character and steady attachment to the royal family. When Charles II. was invited home to receive the crown of the kingdom in 1652, he was constituted colonel of his majesty's foot-guards by the Scots parliament, which then afforded a kind of sovereign authority; but he declined accepting the office, till he obtained a commission from the king; to which honor he was recommended by his fidelity and valor in his service, as well as by his affection and respectful attention to his person. After his majesty's defeat at Worcester, he declined indulging the offer to be made to royal stature, nor did he desert it, when the king's affairs were heavy and desperate, and his own were reduced to a dismal condition. After having capitulated in 1655, to the victorious forces of the English, in consequence of orders from general Middleton, sanctioned by the king's authority, he determined to live peaceably, though he would never acknowledge either Oliver's or Rich's government; and of course he was obnoxious to persons in power, and intimidated by them. After the king's restoration, his enemies, jealousy of the favour and influence which he was likely to acquire, or hired in their attempts to destroy him; and they prevailed with the Scots parliament to imprison him, and to commence a process against him for the crimes, bled in their laws, leuking-making, or creating difficulties between the king and his subjects, by giving the former false informations. They proceeded so far as to condemn him to lose his head, and to forfeit his whole estate; but the king interposed to prevent the final execution of their purposes. At length, his friends came into power, and he was released from a long and severe imprisonment. He was also soon after restored to his grandfather's title and estate, and part of his father's was bestowed to be sold for the payment of his debts. In the subsequent part of this reign, he behaved towards his sovereign with respect and affection: and in his opposition to those measures of the court which he could not approve, he manifested a mild and peaceable disposition. When his majesty thought fit to sending the duke of York into Scotland, in 1661, a parliament was convened, which, among other laws that were proposed and enacted, passed an act for establishing a tell, obliging all who possessed offices, civil, military, or ecclesiastical, to take an oath not to attempt any change in the constitution of church or state. This oath contained several clauses, affecting the king's supremacy, renouncing the covenant, and preventing all obedience, introduced by the court, to which the country party added another clause of adhering to the protestant religion. The courtiers, however, proposed, that all princes of the blood should be exempted from the obligation of taking this oath. Argyll zealously opposed this exception, intimating, that the sole danger to be dreaded, with regard to the protestant religion, must proceed from the perversion of the royal family. His conduct, on this occasion, excited the indignation of the duke, and expelled him to its fatal consequences. When the earl of Argyll took this taff, which he was obliged to do as a privy councilor, he did it with an explanation which he submitted to the approbation of his royal highness, and the whole privy-council. The explanation was allowed, and the earl took his seat at the board. However, to his great surprize, he was a few days after committed to prison, and prosecuted for high treason, lecoming-making, and perjury. Three out of five judges found him guilty of the two first charges, and a jury of 15 noblemen gave verdict against him. The king's leave was obtained for pronouncing sentence against him, but he ordered the execution of it to be delayed. The earl, having little reason to expect either justice or mercy from his enemies, contrived to make his escape from prison, and arrived safely in London, where the place of his concealment was known at court, though the king would not suffer him to be arrested.
the mean while, the privy-council of Scotland publicly pro-
claimed his sentence at the crofs, and caus'd his coat of arms
to be rever'd and torn. As soon as a convenient oppor-
tunity occurred, the earl went over to Holland, and continued there during the remaining part of that reign. Con-ceiving, probably, that his attainder had entirely disdosed the ob-
ligations by which he was bound as a British subject, and confedering the government in Scotland as unfetter'd, before king James II. had taken the coronation oath, he concerted measures with the duke of Monmouth, and passed over to Scotland to assemble his friends: but disappointed in his ex-
pectations of suppr't, he was taken prisoner, and beheaded at Edinburgh upon his former unfait sentence, June 20, 1685. Under his misfortunes he manifested great firmness and self-possession; he ate his dinner cheerfully on the day of his death, and, according to his usual custom, slept after it for a quarter of an hour or more very soundly; at the place of execution he made a short, grave, and religious speech; he caus'd the position of the block to be duly ad-
justed; and after a solemn declaration, that he forgave all his enemies, he submitted to death with extraordinary relo-

**Campbell, Archibald**, first duke of Argyile, was the son of the preceding, and a very active promoter of the re-
'volution. He accompanied the prince of Orange to En-
'gland; was admitted into the convention as earl of Argyile, though his father's attainder was not reversed; and in the Claim of Rights, the sentence against him was declared to be, what it undoubtedly was, "a reproach upon the na-
ton." When it was carried in the Scottish convention, that the crown should be establish'd on the prince and princes of Orange, he was sent from the nobility, together with Sir
James Montgomerie, and Sir John Dairymple, from the barons and boroughs, to offer the crown in the name of the convention, to their majesties, and to tender them the coronation oath. For this and other eminent services, he was admitted a member of the privy-council, and in 1690, made one of the lords of the treasury. He was afterwards appoint-
ed a colonel of the Scots horse-guards; and, in 1694, one of the extraordinary lords of feilion. He was likewise created duke of Argyile, marquis of Kintyre and Lorn, earl of Campbell and Cowell, viscount of Lockow and Gleagla, lord of Inverary, Mull, Morvern, and Ferrey, by letters patent, bearing date the 23d of June, 1701. He sent over a regiment to Flanders, for king William's service, the ofcers of which were of his own name and family, who bravely distinguished themselves through the whole course of the war. Biog. Brit.

**Campbell, John**, second duke of Argyile, and also duke of Greenwich and baron of Chatham, son of the preceding, by Elizabeth daughter of Sir Lionel Talma, was born on the 1oth of October, 1678, and betimes devoted to a military life. At the age of 17 years, he was appointed to king William to the command of a regiment of foot, with which he serv'd abroad. In 1703 he succed'd to the honours and estate of his father; and in 1705 he was nominated lord high commissioneer to the parliament of Scotland. In 1705 he made a campaign under the duke of Marlborough, and distinguished himself by his courage and conduct on several occasions. On his return to Scotland, he promover'd the measure of the Union, and incurred some degree of unpo-
pularity among his countrymen. In the years 1708 and 1709, he performed several important services in his military capacity on the continent; in recompence of which he was, in 1710, infall'ed a knight of the garter. Having joined the tory-party, he was, in the following year, appointed amba'sador extraordinary and plenipotentiary to Charles III.

king of Spain, and commander in chief of her majesty's forces in that kingdom. But by ill-n's and want of suffi-
cient suppr't, he was disabald from attempting any enter-
prise of importance; and, indeed, the peace of Utrecht soon after put an end to hollivities. In 1712 he was appointed commander in chief of all the land forces in Scotland; but as he opposed the measures of the ministry, by refilling the refumation of the grants of crown-lands, by cenfuring the peace of Utrecht, by remonstrating against the extension of the malt-tax to Scotland, and by supporting a bill for dis-
folving the union, which he had once solemnly promover'd, he was deprived of all his employments under the crown.

However, on the accession of George I. in 1714, they were refer'd to him with several additional offices of honour and service. From this time his political conduct was fluctuating and varietal; being occasionally in and out of place, some-
times supporting, and sometimes opposing the ministry; at one time condemning, and afterwards defending floundering armies. In 1718 he was so much in favour as to be ad-
vanced to the dignity of a duke of Great Britain, by the title of duke of Greenwich. He afterwards, at different periods, occupied the poits of lord theward of his majesty's household, master-general of the ordnance, and field-marshal of all his majesty's forces. In 1739 he vigorously oppor'd the administratio'n of Sir Robert Walpole, and was removed from all his places; but regained them in 1741, when that minifter was displaced. Some difficult at the political ar-
'rengements which then took place, induced him very soon to reign them. A paralytic disorder with which he had been for some years afflicted, terminate'd his life in September 1743; and he was interr'd in Westminster Abbey, where a splendid monument, execute'd by Roubilac, was erect'd to his memory, some years after his decease. The titles of duke and earl of Greenwich, and baron of Chatham, became extinct at his death; but his Scottish titles devolos'd on his brother Archibald, earl of Ila. His memory has been usu-
'ally honoure'd with the title of the great duke of Argyile; and he has been celebrate'd in very high terms by Pope and Thomson. The e'cumen of the latter, in his Au-
'tumn, is diffuse: that of the former is more concise:

"Argyle, the rate's whole thunder born to wield, And shake alike the senate and the field."

Epilogue to the Satires, diss. ii.

His character is left favourably sketched by Mr. Macpheron-
'fon in his History of Great Britain, vol. ii. p. 601. Care-
'lefs and eager in his disposition, he neither concealed his re-
'fentment nor disguis'd his designs. With a commanding
'manner, which fresh'd his very forwardness with an appear-
'ance of authority, he was feared by many, but beloved by
'none. Brave in his perf'om, but not remarkable for his con-
duct; he might be consider'd, in his military capacity, as a bold partizan rather than a judicious commander. In
'his civil character, his fire degenerator into a violence, that
'often defeat'd his views. In his public exhibitions in par-
'liament, he was rather spirited than eloquent; better cal-
'culat'd to terrify his enemies than to support his friends. His great defect was a love of money and emolument, which he could not e'fffectually conceal, with all the efforts of his pride. His chief talent was an address in managing the prejudices of the vulgar. He mark'd their opinions as they changed, and fell dexterously down with the tide."

In private life he is allowed to have been an affectionate husband, and an indulgent master, a liberal friend to the poor,
poor, and a generous patron of merit in distress. As a strict economist, he took care to maintain the dignity of his rank, without wasting any part of his income on empty pomp, or unnecessary expenses. Biog. Brit.

CAMPBELL, ARCHIBALD, third duke of Argyll, was born at Han-bonfe in England, in 1682, and educated at the university of Glasgow. Although he studied law at Utrecht with a view to the bar, he declined pursuing it, and devoted himself to a military life. But he soon abandoned the army, and determined on acquiring the necessary qualifications for a statesman. Accordingly, he occupied several posts of trust and dignity in Scotland, which we shall not here enumerate. As chancellor of the university of Aberdeen, he laboured to promote the interest of that, as well as of the other universities of Scotland; and he particularly encouraged the school of physic at Edinburgh, which has since acquired such high reputation. He was a man of great natural and acquired endowments, well versed in the laws of his country, eminent for his knowledge of human nature, and possessed of very considerable parliamentary abilities. As he had the chief management of Scots affairs, he was very attentive to promote the trade and manufactures of Scotland, and to forward improvements for the good of the country. He excelled in conversation, and collected one of the most valuable private libraries in Great Britain. At Inverary he built for himself a very magnificent seat. Having obtained his faculty at full yeur till his 70th year, he died suddenly in April, 1761; and was succeeded in his titles and the estates of his family by John Campbell, fourth duke of Argyll, son of the honourable John Campbell of Mammore, who was the second son of Archibald, the ninth earl of Argyll. Biog. Brit.

CAMPBELL, JOHN, an ingenious writer, was the fourth son of Robert Campbell of Glenlyon, Esq., and was born at Edinburgh in 1708. At the early age of five years, he was brought by his mother to Windsor, where her father resided, and at a suitable age articled to an attorney. But the study of the law not fitting his taste, he devoted himself to a literary life, and in due time engaged in the profession of an author, in which he acquired eminence. His earliest productions are not now known; but in 1736, he published in 2 volumes folio, "The Military History of Prince Eugene and the Duke of Marlborough," &c. The reputation which he acquired by this performance, occasioned his being employed in the compilation of the "Ancient Universal History," in which he wrote, besides other parts that are not positively ascertained, the Coignomy. The first work to which he prefixed his name, was "The Lives of the English Admirals, and other eminent British Scamen," of which 2 volumes were published in 1742; and the two remaining volumes were completed in 1744. This work was so well received, that it passed through three editions in the author's own lifetime, and a fourth has been since reprinted under the inspection of Dr. Berkenbait. His curious and entertaining pamphlet, entitled "Hermippus Redivivus, or the Sage's Triumph over Old Age and the Grave; wherein a Method is laid down for prolonging the Life and Vigour of Man," was published in 1743. This secret is founded upon an ancient inscription preferred in Reinefuus's supplement to Gratler, and confinls in inhaling the breath of young females. Campbell's tract had its origin in a foreign publication, which fugged the idea, improved by our author with additional learning, and in a strain of grave irony, which made it doubtful whether he was in jest or earnest. According to his account, indeed, the true key of the work was an imitation of Bayle's manner of writing on a difficult subject, without discovering to which side his own sentiments inclined. In 1744, he published in 2 volumes folio, a much improved edition of "The History of Voyages and Travels," which was very favourably received. The next work in which Mr. Campbell engaged, was the "Biographia Britannica," the publication of which commenced in 1745; and his articles are allowed to constitute the principal merit of the four volumes through which they extend. With regard to the extent of his research, and the variety of information which he communicates, as well as the correct and animating style, generally elegant, though somewhat too diffuse, in which he writes, he surpasses his contemporaries in that comprehensive and useful work. If he errs, it is on the side of candour, and a freedom from party-prejudice, which have sometimes degenerated into a sylvan of universal panegyric or apology. To the benevolence of his temper, and to some defects of his superior knowledge, and not to any intention of flattering or deceiving, this error ought to be ascribed. To Mr. Dudley's "Preceptor," which appeared in 1743, Mr. Campbell contributed the introduction to chronology, and the discourse on trade and commerce. In 1750, he published the first separate edition of his "Present State of Europe," which became very popular, and which contains, in a moderate compass, a great variety of historical and political information. The next great undertaking, in which our author's abilities and learning were eminently displayed, was "The Modern Universal History," to which he contributed the histories of the Portuguese, Dutch, Spanish, French, Swedish, Danish, and East India settlements in the East Indies, and the histories of the kingdoms of Spain, Portugal, Algiers, Navarre, and that of France, from Clovis to the year 1656. As our author had thus distinguished himself in the literary world, the degree of LL. D. was very properly and honourably conferred upon him, in 1754, by the university of Glasgow. During the intervals of his greater labours, several smaller and anonymous works proceeded from his fertile pen. Among these, we may reckon his "Description and History of the New Sugar Islands in the West Indies," which was written upon the conclusion of the peace of Paris, at the request of Lord Bute, as a vindication of that peace. This tractate was designed to shew the value and importance of the neutral islands that had been ceded to us by the French. It was prefixed to his majesty with a MS. dedication. It was probably in recollection of his political services, that he was appointed in 1765 the majesty's agent for the province of Georgia, in North America, which employment he held till his decease.

The last and great work of Dr. Campbell, to which he had devoted many years of his life, was his "Political Survey of Britain," which appeared in 2 vols. 4to, in 1774. In this work, the author's patriotism and the extent of his knowledge were eminently displayed; but though it must be allowed to contain numerous plans and hints of improvement, which might have conduced to contribute to the prosperity of this island, yet the whole of its projects are founded on erroneous principles, others are of questionable importance and utility, and the reader, who wishes to acquire a just knowledge of the state of these kingdoms, should consult it with caution. The discussions to which it leads engaged the author in a very extensive correspondence; and he derived from it a very considerable increase of reputation. Dr. Campbell's literary character was highly respected not only in his own country, but in the remotest parts of Europe. To this purpose it may be mentioned, that the empress of Russia, in 1774, condescended to honour him with the present of her picture, drawn in the robes worn in that country in the days of John Baliofowitz, grand duke of Muscovy, who was contemporary.
with queen Elizabeth. In return, the author conveyed to
St. Peterburg a part of the "Political Survey of Britain,"
bound in morocco, highly ornamented, and accompanied with
a letter descriptive of the triumphs and felicities of her reign.

As Dr. Campbell's literary engagements allowed of few
foreign avocations, his life was sedentary and domestic; but
by exercise in his garden and house, and a course of tempera-
ture and ablutions, he guarded against the inconvenience
incident to this kind of life; and enjoyed a good rate of
health, though his constitution was delicate. His general
reputation, and his instructive, cheerful conversation, drew
to his house, particularly on a Sunday evening, a great
number of literary friends and personages of all ranks and pro-
fessions, who were desirous of testifying their respect for his
merit, and of deriving improvement and pleasure from inter-
tercourse with him. His knowledge was far from being
restricted to those subjects which employed his pen as an
author; but he was well acquainted with mathematics and
medicine, with the ancient and modern languages, and with
the different parts of sacred literature. His memory was
singularly retentive; and he had an uncommon facility in
communicating his ideas. The style of his works had been
formed upon the model of that of bishop Sprat, and was
perspicuous, easy, flowing, and harmonious. "To all
these accomplishments of the understanding, he joined the
more important virtues of a moral and pious character. His
disposition was gentle and humane, and his manners kind
and obliging. He was the most tender husband, a most in-
dulgent parent, a kind master, and a fine and sincere friend.
To his great Creator, he paid the constant and ardent tri-
but of devotion, duty, and reverence; and in his cor-
respondence he showed that a sense of piety was always nearest
his heart. It was our author's custom every day to read
one or more portions of scripture in the original, with the
ancient versions, and the butt commentaries before him;
and in this way, as appears from his own occasional notes
and remarks, he went through the sacred writings a number
of times with great thankfulness and advantage. His蕨ere
study at length brought on a decline which terminated his
life, December 28, 1775, when he had nearly completed
the sixtieth year of his age.

Campbell, George, an eminent metaphysician, divine,
and biblical critic, was the youngest son of Mr. Colin Camp-
bell, one of the ministers of Aberdeen, and born in that
city, December the 25th, 1719. Although he had the
misfortune to lose his father at an early age, he made a con-
siderable proficiency in the Latin and Greek classics at the
grammar school, and Marischal college of his native place.
It was his original intention to follow the profession of
the law, and with this view he actually served an apprenticeship
with a writer to the signet in Edinburgh. But being from
disgusted with this employment, he directed his attention to
the study of the scriptures, and determined to acquire the
qualifications that were necessary for the office of a clergy-
man. Accordingly, in 1741, before the term of his ap-
prenticeship was fully completed, he attended the divinity
lectures of professor Geddie at Edinburgh; and he after-
wards entered himself, as a student of theology, both in
King's college, under the care of professor Lumiden, and in
Marischal college, under the tuition of professor Chalmers.
Beside the advantages which he enjoyed at the university
for the prosecution of his theological studies, he belonged
to a literary society of 14 learned persons, which was es-
established in 1742, and which afforded him additional means
and opportunities of improvement.

After completing his studies at the university, and passing
through the usual trials before the presbytery of Aberdeen,
Mr. Campbell was licensed as a probationer, or preacher,
in 1746; and two years after he was ordained minister of
Banchory-Teman, 17 miles W. from Aberdeen. In this
situation he excelled as a Scripture critic and lecturer; and
composed a variety of discourses, which were disinguished
by the simplicity and perspicuity of their style. Here he
formed the plan of his Translation of the four Gospels, and
here he also drew up a part of his Philosophy of Rhetoric.
During his settlement in this country parish, he married a
lady, who contributed in a very great degree to the pro-
longation and happiness of his life. In June 1757 he was
translated to Aberdeen, and became one of the ministers of
that city, where his character as a lecturer was fully esta-
blished, and where he delivered a variety of ingenious and
learned discourses on rhetoric, criticism, and other subjects,
in a literary society, projected on a larger scale than that to
which he had formerly belonged; by the late Dr. Reid of
Glasgow, and Dr. Gregory, who were at that time pro-
ectors of King's College, and established in 1758. His first
publication was a sermon, preached in 1752, at the opening
of the session in Aberdeen, on the character of a minister, as
a teacher and pattern; but as he probably thought that the
style of this discourse was too highly ornamented, he did
not include it in the number of sermons, which he collected
a few years before his death. In 1759 he was professed by
his majesty to the office of principal of Marischal College,
then vacant by the death of principal Pollock. His ad-
vancement to this honourable office was partly owing to
the interest of Archibald duke of Argyle, to whose family he
was related, and partly to his known character as a man of
distinguished abilities and literature. Soon after his appoint-
ment to this office, he published his celebrated "Dissertation
on Miracles," in answer to Mr. Hume's essay on this sub-
ject, and thus deservedly gained the reputation of a most
acute metaphysician, and a well-bred polemical writer.
The substance of it was delivered in a sermon before the pro-
vincial synod of Aberdeen in 1763, and afterwards moulded
into the form of a dissertation. Before it was published a
copy of it was sent to Dr. Blair of Edinburgh, and com-
municated to Mr. Hume; and when the author had availed
himself of the remarks both of his friend and of his opponent,
he presented it to the public in 1763. Mr. Hume, in a let-
ter addressed to the author, acknowledged the civil and
obliging manner in which he had been treated; and the Dis-
sertation was so well received by the public, that it soon
passed through several editions, and was translated into the
French, Dutch, and German languages. For a particular
account of the author's reasoning in this dissertation, see our
article Miracles. Some time before the publication of
this treatise, the author, without any solicitation on his own
part, received the degree of doctor of divinity from the
neighbouring University of King's College in Old Aberdeen;
which he was more ambitious to defend than to ob-
tain. Dr. Campbell continued for 12 years to discharge
the offices of principal of Marischal College, and of one of
the ministers of Aberdeen; which he did with great honour to
himself and satisfaction to those with whom he was con-
nected. During this period he amased himself with the
study of history, in which he became a great proficient, and
broke acquiring a considerable knowledge of Hebrew, as
well as improving his acquaintance with the Greek and La-
tin, he made himself master of the French and Italian, so as
to become a critic in these languages. In 1771 he was
elected, by the town-council of Aberdeen, professor of
divinity in Marischal College in the room of Dr. Gerard;
and though he refused his pastoral charge as one of the minis-
ters of Aberdeen, the united offices of principal and professor of
Marischal
Marischal College devoted upon him a variety of duties, which required great application and exertion. As professor of divinity he nearly doubled the number of lectures which the students had been accustomed to receive, and he fulfilled his course in four years, so that every student had an opportunity, if he thought proper, of attending the whole of it. His lectures, in the plan or outline of them, were equally simple and comprehensive. They contained, under the theoretical part, every thing that the student of divinity should know; and, under the practical branch, every thing that he should do, as a reader of sacred and church history, a scripture critic, a polemic divinity, a pulpit orator, a minister of a parish, and a member of the church courts on the Scotch establishment.

Under the first head, or theory, he included sacred and church history, scripture criticism, and polemic divinity. On sacred or church history he delivered those lectures, which he afterwards prepared for the press, and which were published after his death by the Rev. George Skene Keith, in 1825, under the title of "Lectures on Ecclesiastical History," 2 vols. 8vo. On the subject of Scripture criticism, instead of a tedious and uninteresting dilution of many separate and minute particulars, he laid down general rules or canons, by which the students themselves might be critics without depending upon any commentator. These canons were published in his translation of the four Gospels. His general directions with regard to polemic divinity may be summed up in the following sentences, which, being expressed in the most simple and concise language, may be soon read and safely remembered.

We shall embrace them for the benefit of those readers whom they may more immediately concern. "Begin with studying the Scriptures in the original languages; attend carefully to the conclusion, that should always be made, between classical and pure Greek, and the Greek of the Septuagint and Testament, where the words, taken separately, are pure Greek, but where the idiom of the language, and even the acceptance of many of the words, is derived from the Hebrew, the Chaldaic, or the Syriac. Be acquainted with the civil history, the manners and customs of ancient times and nations, especially with that of the Jews, where the reader or listener will often be useful. But whatever books you read occasionally, read the Scriptures frequently. Mark the different passages which you do not understand; read them with patience, not being too anxious to understand every thing at the first reading over. But perforce and read the Scriptures in the original, a second and a third time; and, without consulting any commentator, those difficult passages will always become fewer as your knowledge increases. Read the Scriptures also with modesty, neither being too full of yourself, nor supposing that human reason can always comprehend divine mysteries: and read them always with fervent prayer to God, the source of wisdom and light, that he would assist and direct you in your researches after truth. Do not complain that you want books, when you have the Scriptures themselves in the original languages. If you have a Hebrew Bible, a Septuagint, and a Greek New Testament, you have the most necessary, and the most useful, of all books to a Christian divine. Read carefully all the versions which are given of disputed passages: make much use of versions, and compare them all carefully with the original. Read the Vulgate, though a translation authorized by the Romish church, as well as the versions of individuals, such as Calvin, Beza, Junius, and Trelion; and also Hebram, if you have access to his translation. You cannot be hurt by reading versions, and comparing them with the original. But put no confidence in commentators. Consult them sparingly, never use them till the last, and then use them only as dictionaries. In this view, however, read commentators of all parties; and judge of them more from their freedom of thought, abilities, and candor, than from considering to what party they belong. In comparing the different kinds of commentators with one another, remember, that paraphrases are the worst, because they undertake too much or promise too little; while scholiasts are the best, because they undertake and promise least. Be on your guard against too much ingenuity in commentators: for genius, in this case, has often led them astray, where humble piety, and plain common sense, would have kept them in the right path. Beware particularly of any attachment to a pre-conceived system; and do not think, that you will be safe, if you use what you call an approved commentator. (It is a pity, though there was a danger of being misled, that a young man of taste, learning, and genius, should be chained to the opinions, or kept in the trammels, of a commentator.) See always with your own eyes, and not through the spectacles of polemics, commentators, or paraphrasts. Remember that your errors will be much more pardonable, when you use your own eyes, and when you come short of the truth, after making the best use of your own reason, than when ye are led implicitly by passion, or by prejudice. Let your religious system be the last thing that ye make; or where ye have made one in early life, be still correcting it, as you acquire more knowledge—not contending for the opinions of men, but enquiring after the mind of the Spirit."

Under the second general head, viz. Practice, or the practical part of theology, Dr. Campbell delivered several excellent lectures to the students, comprehending pulpit eloquence (See Elocution), propriety of character in private life, or teaching by example, and propriety of character in public conduct. His manner of delivering these lectures was such as to captivate and fix the attention of his students. His deep and extensive erudition was irritated by his fine imagination; and those lectures, which were the most abstractive and learned, were rendered entertaining by strokes of wit and humour which Dr. Campbell took occasion to introduce. Besides, he recommended himself to the students, not only by the judiciousness of his criticism, and by his lively mode of lecturing, but by the conscientious and amiable ness of his whole conduct.

Dr. Campbell, in his 72d year, was seized with a severe illness, which threatened his life; but, contrary to his own expectations and those of his friends, he recovered; and though his bodily strength was impaired, he returned his former occupations and studies. Some years before his death he made a disinterested and unobtrusive offer of resigning his professorship of divinity, provided that any one of those gentlemen whom he named, and to whom he applied for their consent, were chosen to succeed him. The offer, however, was not accepted by the patrons of the professorship, and he contented to retain it, a left an improper person should, in his life-time, be chosen as his successor. But when application was made to him, and also to the town-council of Aberdeen (the patrons of the professorship) in favour of Dr. William Laurence Brown, late minister of the English church, and professor of moral philosophy, of the law of nature, and of ecclesiastical history, in the University of Utrecht, who had been driven from these offices in consequence of the French invasion, he instantly resigned, in 1795, his charge of professor of divinity and minister of Gray Friars, which were worth 160l. a year; and expressed much satisfaction in the appointment of his successor. Soon after his resignation of the professorship, government, deprived of its justifying, in a public manner, the high respect fo
Campbell.

Justly enterprising of his abilities and services, offered him, on condition of resigning the principalship of Marischal College, a pension of 350l. a year. Dr. Campbell accepted this token of his majesty's munificence, and was succeeded in the office of principal also by Dr. Brown. This pension, however, he did not live to enjoy; though he continued writing till within a week of his death; an event, which he expected with great tranquillity and composure.

On the 31st of March, 1796, after some previous symptoms of unfeeling, he was struck with the palsy, which deprived him of speech, and under which he languished for a few days till he died. He had long accustomed himself to prepare for death; in a former illness he had given the testimony of a dying man in favour of religion; and, therefore, he was peculiarly happy in not feeling the pangs of distracting nature. A funeral sermon was preached, on occasion of his death, by Dr. Brown, in which he has given a sketch of his character as a public teacher, as the head of a public seminary of learning; and as a private Christian. His character is thus summed up in a few sentences by his biographer, Mr. Keith. "His imagination was lively and fertile—he understood equally acute and vigorous—and his erudition was at once very deep and wonderfully diversified. His piety was unfeigned—his morals unimpeached—his temper cheerful—and his manners gentle and unassuming. His love of truth was even more remarkable than the uncommon success with which he fought after it. Where intuitive faculties could be of service to any man, he faw at once if he faw at all. But his deep peripatetico was not satisfied with a superficial view of any thing: his piercing eye darted to the bottom of every subject, to which difference could be applied. Where study and reflection were necessary, he could bellow as much time on patient thinking, as if he had been pofted of no genius at all, and had acquired only a small share of erudition. And when once he began to examine any subject, he was never satisfied till he had viewed it in every light in which it could be seen. He always fought for truth in the love of truth, but he could not bear to be suspected of deviating from it: for he neither courted those who might support, nor feared those who did oppose him. The tone of his mind was high, and he would not let it down from the elevation of truth and of virtue. Whether engaged in conversation, or employed in study, he would pass with the lightest subject to the most serious one. And the reach of his mind was so great, as to comprehend a great variety of subjects. He could explore the caufes of that pleasure, which arises in the mind, from dramatic entertainments, and lay down the rules of Scripture criticism. He could illustrate the whole theory of evidence, or detect the falfe reasonings of Mr. Hume. He could explain the spirit of the Gospel, marking the extremes of superstition and enthusiasm; and both as a philosopher, and a divine, declare the nature, extent, and importance, of the duty of allegiance. While he zealously contended for the faith, he could warn the Christian against imbibing a perverting spirit and yet show the influence of religion upon civil society, warning his countrymen against indolence, before they had seen its dreadful effects. He could, with manly eloquence, deliver the sermons of the fishermen of Galilee, while preaching the doctrine of the crofs to prejudiced Jews, learned Greeks, and ambitious Romans; and at the same time, with well applied erudition, he could delineate the characters of the pretended successors of the apostles, and trace the progress of the hierarchy through all the dark and middle ages, until the reformation of religion. As the principal of a college, a professor of divinity, or a minister of the Gospel, as a true patriot, a good man, and a sincere Christian; Quis alterius invitus forens?" His different publications in chronological order, before the Differration on Miracles, and a single sermon already mentioned, are as follow:—In 1771, he preached before the Synod of Aberdeen his sermon on the Spirit of the Gospel, in which he dwelt at once both at fanaticism and superstition, and at fancies and superflitious perons of all parties and descriptions. In 1776, he published his "Philosophy of Rhetoric," which established his reputation, as an excellent grammarian, an accurate and judicious critic, a man of fine imagination and delicate taste, and a philosopher of great acuteness and deep penetration. The two first chapters of this book had been composed as early as 1750; and a remarkable coincidence had taken place between him and Dr. Brattie, on the subjects of wit, humour, and ridicule. In 1776 he preached a sermon on the National Fast, occasioned by the American war, in which he discusses the nature, extent, and importance of the duties of allegiance, and which was very popular. Six thousand copies of it were afterwards published at the desire of those in the city, and circulated through America. Although in this sermon he maintains, that the British colonies in America had no right, either from reason or from Scripture, to throw off their allegiance, he infinuates that America should be allowed to be independent rather than that Great Britain should continue the war. In 1777 Dr. Campbell published a sermon on the success of the first publishers of the Gospel considered as a proof of its truth, before the society for propagating Christian knowledge, in which he states this argument for the truth of Christianity in a very forcible manner. In 1779 he published an address to the people of Scotland, on the alarms which had been raised by the bill in favour of the Roman Catholics; in which address he considers the doctrine of the Gospel with regard to perfection; the conclusions to which would lead us in the toleration of the papists; and the proper and Christian expedients for promoting religious knowledge, and reprefenting error. This address exhibits a striking evidence of the liberality of the author's mind, with respect to those who differ from him in opinion, and of his dislike of every speeies of intolerance and persecution. In the same year he published a sermon on the happy influence of religion on civil society, which was preached at the small fees at Aberdeen. In this valuable discourse the preacher has shewn, in the most satisfactory manner, that "Religion is highly conducive to the exaltation and felicity of the body politic, or nation, by the tendency and extent of its laws, by the affiffance which it gives to the civil powers, both in securing fidelity and in discovering truth; by the nature and importance of its functions; by the positive enforcement of equity and good government on the rulers, and of obedience and submission in the people." The last work which Dr. Campbell lived to publish, was his "Translation of the Four Gospels, with preliminary Disquisitions and explanatory Notes," in two 4to. volumes. His pithy and laconic work, entitled "Lectures on Ecclesiastical History," has been already mentioned. See Keith's Account of the Life and Writings of Dr. George Campbell, prefixed to his "Lectures."
CAMBELL, the father of an American captain, Charles Campbell, who obtained a patent for it in 1751; from the governor of Virginia. Since the discovery of salt-water, and the manufacture of salt in this district, it is become very valuable, and many thousands of people are now supplied with it from a superior quality, and at a low price. It consists of about 300 acres of salt marsh land, in which pits are sunk for obtaining the salt water. The bell is found at the depth of from 30 to 40 feet; and after passing through the rich soil or mud, from 6 to 10 feet, you come to a very brittle lime-rock rock, with cracks or chasms, through which the salt-water issues into the pits, whence it is drawn by buckets and put into the boilers, which are placed in furnaces adjoining the pits. The hills, that surround this flat, are covered with fine timber; and a coal-mine has been discovered not far from it.

CAMBRIDGE-town is a royal borough in the county of Argyle, Scotland, seated on the banks of the lake of Killerran, on the easterm shore of Kintyre, of which it is the prebathy seat. This place was merely a small fishing village till 1701, when it was constituted a royal borough, and obtained its present appellation. Previous to that period it was called Ceann-loch (Loch-head) which it still retains in the provincial language of the country. From the establishment of a fishery here, and the advantage of a good harbour, this place has greatly increased in size and consequence. The harbour is about two miles long by one broad, and affumns the form of a crescent. It is surrounded by high hills, and protected at the entrance by an island. The anchorage is good, and meafures from fix to ten fathoms water. It is appointed the rendezvous of the buffies engaged in the herring-fifby, which is the principal trade of the place. Beside the fifby, here is a confiderable trade in the dilillation of whifkey. The parish of Cambridge-town is about 12 miles by 8, and includes the greater portion of the district called Kintyre. It is narroved in the middle by the bay of Machyr-hanifh on one fide, and the loch of Killerran, or harbour of Cambridge-town, on the other. The foil of the parish is various, but the arable land is well cultivated and fertile. At the distance of three miles are two coal-pits, and a canal has lately been finifhed to communicate with the collieries and the town. A quantity of fullcr-earth, or a kind of foamy rock, is obtained in this parish. In 1791 the population amounted to 3,795. This town, with Air, Irvine, Inverary, and Rothsay, unite in sending one member to the imperial parliament. It lies 176 miles W. by S. from Edinburgh.

CAMDEN-town, a large and flourishing town of America, in North Carolina, feoted on a branch of Cape Fear river, 100 miles above Wilmington; the refort of many inhabitants and travellers, who carry on a continual commerce by waggons, from the back cettlements, with large trading boats. - Alf, a village in Dauphin county, Pennsylvania, feated near a water of Quittipinna creek; 13 miles E. of Harri- bury, and 96 N. W. of Philadelphia.

CAMDEN, or CAMDEN-CHIPPING, anciety CAMBER-DEE, is a borough and corporate town of Gloucesterfhire, England, situated in a fertile valley, surrounded by cultivated halls and hanging woods. Its remote origin may be inferred from the circumstance of the Saxon kings afluming here, in the year 687, to confer on the mode of carrying on the war with the Britons. They were interdicted by a public spirited attorney, named Robert Dover, of Barton-on-the-Heath, in Warwickshire, and, like the Olympic games of the ancients, confided of noth kinds of manly exercises. The victors were rewarded by prizes distributed by the projector, who for many years superintended the games in person. Ben Jonfon, Drayton, and other poets of that age, wrote verses on this festivity. These were collected into one volume, and published under the title of "Annales Daurbrefia," in 1636. The breaking out of the civil war terminated these diversions; but the remembrance of them is yet preferred by an annual meeting of...
of young persons on Dover-hill, an eminence about half a mile from Campden, where the principal games were celebrated.

CAMPEACHY, a town of America, in Old Mexico, or New Spain, situate in the province of Yucatan, on the west shore of a bay of the same name in the gulf of Mexico. Its houses are well built of stone; when taken by the Spaniards, it contained 3000 houses, and had considerable monuments of Indian art and industry. It has a good dock and fort, with a governor and garrison, commanding both the town and harbor. It has been often formed and taken, both by the English and French buccaneers, viz. in 1633, 1678, and 1689, and the last time these buccaneers plundered the whole country within 15 miles about it, set fire to the fort and town, which the governor would not consent to ransom, and burnt to the value of 70,000 l. of Campeachy wood, which was a part of their share of the plunder. The port is large but shallow; and it used to be a flatted market for log-wood, of which great quantities grew in the neighborhood, before the English landed there, and cut it at the illaus, which they entered at Trieste island, near the bottom of the bay, 40 leagues S.W. from Campeachy. The chief manufacture is cotton cloth. N. lat. 19° 30'. W. long. 91° 30'.

Campeachy, or Campeche Wood, in Botany. See Hæmatoxylon Campechenum.

Campeggi, Lorenzo, in Biography, an eminent civilian and prelate of the Romish church, was born at Milan in 1473; and having been educated to the profession of the civil law, taught it first at Padua, and afterwards at Bologna. After the death of his wife, he entered into the ecclesiastical statute, and in 1540 was made auditor of the Rota at Rome. In 1521 he was advanced to the bishopric of Feltre by Julius II. and deputed as his nuncio to Milan and into Germany. In 1517 he was created a cardinal by Leo X.; and in 1516 lent as legate to England to collect the tithes for the war with the Turks; but he only succeeded in obtaining the bishopric of Salisbury. In 1524 he was appointed bishop of Bologna, and delegated by Clement VII. to oppose the progress of Lutheranism in Germany. His legation to Henry VIII. of England, with which he was intrusted in 1528, was a very difficult charge, as, in conjunction with Wolsey, he was to pronounce sentence concerning the king's divorce from his queen Catherine. When Henry could not be prevailed upon to renounce his project, Campeggi tried to persuade Catherine to consent to a voluntary separation, that he might thus save the honour and authority of the church; but his endeavours were unsuceedful. In the following year he was recalled to Rome, and commissioned to attend as legate at the diet of Augsburg. He died at Rome in 1539; having, as a man of learning, enjoyed the esteem of Erasmus and of other eminent scholars, and having approved himself a faithful servant of the church, in times and circumstances peculiarly critical and embarrasing. His constitution for the reform of the German clergy, and his letters, throwing light on the history of his time, of which the principal are found in a collection of letters written to Frederic Nautes, and printed at Basle in 1550, are the only literary remains of him that are extant.

His brother, Thomas Campeggi, who succeeded him in the bishopric of Feltre, was a learned canonist, publised several works relating to the canon law, and died in 1564. Moreri. Tiraftobhi.

Campello, in Geography, a town of France, in the department of the Ille and Villaine, and district of Redon; 54 leagues S.W. of Rennes.
and impatience, of which, however, only two parts were published; viz. "Demonstrationes Anatomicae. Pathologicae et Medicinae," Liber primus, continens brachii humani fabricam et musculos, in folio maximo, cum quatuor figuris," Amsterdam, 1752; and "Liber secundus, continens pelvis humanae fabricam et musculos," 1756. The plates, which are commended for their accuracy, are from drawings made by the author. A small time before his death he published in a Dutch journal at Amsterdam "An Account of a Method of performing the Operation of Lithotomy at two different times, by Peter Camper, M.D. &c." The process was communicated to him, he says, by M. Louis, who assured the author that since he adopted it, he had not lost a single patient by lithotomy. The operation is performed at twice, that is, on the first day the surgeon makes the incision into the bladder, the patient is then to be put to bed, and the extraction of the bone deferred until the second, third, or fourth day. By this delay, the bone was at length taken away with greater facility, and with less pain to the patient, than when the whole of the bone was completed at once. The method is not, however, new; it had been recommended by Peter Francesco, who lived more than two centuries ago, and it has long since been laid aside again, as attended with much greater inconveniences than the advantage expected compensate. A translation of this paper is published in the tenth volume of the London Medical Journal for the year 1783.

In 1789 his son, M. Adrian Gilles Camper, published at the Hague, in Latin, "A Diflertation on the fracture of the Patella and Olerason," by his father, 4to. The object of this dissertation is to inquire into the various circumstances attending the accidents which are distinguished by the general name of fractured patelle. It is enriched with a large number of cases, and with quotations from, and references to, the most celebrated authors on the subject; and it is accompanied with two plates, which do not reflect much honor on the artist. The last describes the perfect cure of a fractured patella, though the upper and lower parts of the bone remained four inches distant from each other. In 1791 his son published at Utrecht in 4to. another work entitled "Verhandelingen van Petrus Camper over het natuurlyk Verhulder Wezenbreken," &c. "i.e. Treatise of the late Peter Camper on the natural difference of features in persons of various countries and ages; and on beauty, as exhibited in ancient sculpture and engravings. Followed by the description of a method of delineating various forts of heads with accuracy. The professed object of this publication is to prove that the principal rules laid down by the most celebrated painters and limners, are very defective; that they enable the student neither to delineate national characteristics in the countenance, nor to imitate the beauties of ancient sculptors and artists. He contends that the observations of the abbé Weinckelman, concerning ideal beauty, are not well founded; and he professes to have discovered, in what that species of beauty really consists. It is in consequence of the imperfectness of rules, he observes, that men of eminence have been so defective in their portraits of national characters; thus, in the paintings of D. Wit the chief signature of a Jew is a long beard; and Guido Reni, C. Marat, Rubens, and others have given no other characteristic of Moors than a black complexion. He denies the propriety of making either the oval, as is the most common method, or the triangle, as some artists have proposed, the foundation of portraits to be taken in profile; and he proposes more certain principles in their place. Neither the author's principles nor his mode of illustrating them, can be well understood without the plates that accompany this work. The general doctrine, however, is, that the difference in form and cult of countenance proceeds from the relation which the cranium is found to bear to the direction of an horizontal and a perpendicular line. Let us suppose a frame of wood, similar to that of a picture, to be made perfectly square; and that the upper part he graduated into 90 degrees, proceeding from the right to the left. Let the cranium or head be placed in the centre of this frame. Draw an imaginary line from the lower part of the upper lip to the forehead, which the professor terms the linea facialis, and observe in what degree it intersects the upper part of the frame; and this will give one characteristic, and the situation of the maxilla, respecting the perpendicular side of the frame, another. E. G. the linea facialis of the orang will intersect the horizontal line at 58°; that of the Negro at 70°; that of the European; at 80 or 90°; while, in the Greek antique, the facial line will project ten degrees beyond the limits of the frame, forming an angle in a different direction. In the ape, the negro, and the cannuck, the maxilla project in various proportions beyond a perpendicular line drawn from the lower part of the forehead to the chin; in the European, the maxilla are on a plane with the perpendicular; and in the antique, they recede within it. According to this position of the linea facialis, are every other part of the head, the position of the eyes, of the mouth, ears, &c. regulated. This Camper proves by various examples.

In 1792 the professor's son published at Utrecht, in 4to. a sequel to the preceding treatise, entitled, "Reden voeringen van wylen Petrus Camper, &c." i.e. Lectures of the late Peter Camper on the manner of delineating the different emotions of the mind in the countenance; — on the striking resemblance between quadrupeds, fowls, fishes, and the human species; — and on the constituent beauty of form. Illustrated by plates. The first lecture treats of the manner of representing the different emotions of the mind. For this purpose the first object, he says, is to become well acquainted with the form of the cranium; — the second, with the principal muscles of the face; — and the third, with the nerves which act these muscles in motion. E. G. a person under the influence of sorrow and melancholy, suffers his head to sink, as it were, under the weight of the oppression, or he supports it with his hand. The muscles of the neck no longer maintain the equi-poise; that is, the nerves belonging to the neck are rendered inert by the influence of this passion. On the contrary, a person under the influence of mirth and of violent laughter, elevates his head; his brow is agitated; he holds his lides with both hands; his legs begin to fail him, and he would roll on the ground, if the fit continued. A man in a rage, beats with his hands, flamps with his feet, and his face is violently convulsed. Respect impedes speech; an inward trembling takes away the power of motion, the heart beats, and the livid eyes look downward; if shame accompanies the emotion, the blood paints the face, neck, and breast with crimom. Thus, in all emotions, particular nerves are affected; and, consequently, it is the business of every painter to make himself acquainted with these, &c. Conformably to this plan, the professor has first given to his audience a general idea of the form of the cranium, of the principal muscles of the face, and traced the course of the nerves, proceeded to point out, by various drafts or sketches, the changes produced in the countenance in the emotions of surprise, contempt, complacency, laughter, sorrow, weeping, wrath, and in death. The second lecture treats of the similarity which exists between quadrupeds. The professor maintains that in all the larger animals, inhabiting the three elements, there is one part of the body common to all, and very similar in its form; that the great diversities observable in the animal creation, from man down to the finny tribe,
proceed from the diversity which takes place in the appendages to this central part; and that these diversities are according to the nature of the animal, to the element which it is defined to inhabit, to the kind of food by which it is nourished, and to the particular manner of obtaining this food. The permanent part is the trunk, that is, the vertebrae of back and loin, with the ribs. He then illustrates this general idea in the horse, camel, elephant, greyhound, &c. and then deduces the following self-evident conclusion, that the more perfectly an artill is acquainted with the nature of animals, and the designs of their formation, the better he will succeed in delineating them. In the sequel of this lecture, various rules are laid down, and examples given, by which artills may be enabled accurately to delineate the horse, cow, dog, camel, &c.; or, with a few strokes of the pencil, to convert the one into the other, merely by an attention to these rules, and to the deviations which take place in consequence of the particular nature of the quadruped. In the third lecture the idea is extended to birds and fish.

In the year 1803, a collection of Camper's works was published at Paris, in 5 vols. 8vo. and a folio atlas of plates, under the title of "Oeuvres de Pierre Camper, qui ont pour Objet l'Histoire Naturelle, Physiologie, et l'Anatomie Comparée, &c." i.e. The works of Peter Camper, which treat of natural history, physiology, and comparative anatomy. To these volumes a general account of his life, by his son, is prefixed, by which we have availed ourselves in the compilation of this article. The first volume comprehends a dissertation on the origin of the orang outang, and some others of the monkey tribe, a memoir on the double-horned rhinoceros, another on the rein deer, and conjectures relative to some petrified bones found in the mountain of St. Pierre, near Maestricht, which professor Camper considers as the bones of fish. In his account of the orang outang, the professor remarks, that immediately below the skin and platyma myoides, two bags made their appearance on each side of the wind-pipe, the right extending over the clavicle, the left being much less. These bags were empty, and each of them communicated with the cavity of the larynx, by means of an opening passing between the thyroid cartilage and the es hyoïdes, and terminating at the side of the epiglotis. Some species of monkeys had one bag of a similar kind, but the possession of two of the professor confers as peculiar to the orang outang. This organization seems to have been known to Galen; but its uses are unknown, except that these cavities can be filled with air, and compressed, at the pleasure of the animal. The professor observed a conformation in the throat of the rein-deer, resembling that noticed above, with regard to some kinds of monkeys. The second volume is chiefly occupied with an interesting account of the elephant; and this article is followed by two essays, one on the physical reasons which render man subject to more diseases than other animals, and on the means of establishing health, which can be derived from comparative anatomy; the other on the origin and the colour of the negroes. Their origin is ascribed to our first parents, and their colour to the long continued effects of the climate in which they lived, the food by which they were nourished, and the diseases to which they were subject. The third volume contains lectures on an epidemic disease of horned cattle; a dissertation on the physical education of children; lectures read to the Academy of Painting; an account of the generation of the pipa, or American toad; observations on the croaking of male frogs; and an account of the structure of the bones in birds. In his lectures delivered to the Academy of Painting, the author discourses the subject of physical beauty, and his general conclusions are the following: viz. That no philosopher, or artist, has ever proved or taught what properly constitutes physical beauty;—that we have no innate idea of this, as we have of moral beauty; and that it is only by means of fancy that we arrive at the knowledge of what is beautiful in the imitative arts;—that physical beauty, whether in man and other animals, or in architecture, does not consist in a certain proportion or symmetry of parts;—that in giving different forms to men and animals, nature has not aimed at endowing them with a certain degree of beauty, but only at bellowing upon them what is useful in their particular sphere;—that all which relates to physical beauty is founded only on tact, content, habit, and authority;—and that the true and only beauty which exists, and such as the greatest masters have introduced into architecture, painting, and sculpture, can be referred to nothing more than the care which they have taken that their works should imitate nature as faithfully as possible; while they, at the same time, avoid the faults which necessarily result from the imperfection of vision, and the refraction of light. No particular form, says this author, can, abstractedly considered, constitute beauty; the real basis of beauty, according to his reasoning, consists in the means being adapted to the end; and, exclusively of this, our ideas are influenced by customs, national prejudices, and implicit confidence in the taste and opinions of others. This is a subject which has been treated with metaphysical acumen by Burke, Smith, Alison, and Sayer. See Beauty.

The essay on the structure of the bones of birds, which terminates this work, contains an account of the same peculiar conformation which was described by Mr. John Hunter in the Philosophical Transactions for 1774; but it appears that this curious structure was discovered by professor Camper three years before Mr. Hunter's publication of it, and that it was soon afterwards made known to many scientific men on the continent. The account of the professor's discovery was mentioned in a dissertation read by M. Charnack, at a public meeting of the university of Groningen, August 25, 1773, but Mr. Hunter's paper was not read to the Royal Society till the February following. See Bird. The atlas accompanying these volumes contains a number of well executed plates.

Campestre, in Antiquity, a sort of cover for the privities, worn by the Roman soldiers in their field exercises; being gilt under the navel, and hanging down to the knees. The name is supposed to be formed from campestre, the field or place where the Roman soldiers performed their exercises.

Campestris, in Entomology, a species of Cimex, commonly found in meadows. The colour is yellowish, with a ferruginous spot on the wing-cases. Fabricius.

Campestris, a species of Cicindela, common in most countries of Europe. It is of a green colour, with five white dots on the wing-cases. Linn. &c. inhabits sandy fields chiefly. Donovr. Brit. Inf. &c.

Campestris, in Ornithology, a species of Alauda, about seven inches long, that inhabits Europe. The tail-feathers are brown, with the lower half, except of the two middle ones, white; chin and breast yellowish. Linn.

This is called by Briston Alauda Campestris, and by Ray and Willughby, Alauda minor Campestris, Spiolette by Buffon, Brachyderhe by Fretch, and meadow-lark by Latham.

Campshire, or Campitor-tree, in Botany. See Laurus camphora.

Campophor is a white translucent vegetable product, somewhat unequulous to the touch, and tenacious between the teeth; it may be crumbled between the fingers without difficulty; it has a peculiar fragrant odour, not unlike that of
of rosemary, which diffuses itself to a considerable distance: its flavour is aromatic and bitter, giving at first the sensation of heat, but afterwards of remarkable cold. Its specific gravity is 0.966, so that it will float on the surface of water: when exposed to a moist and warm air, it readily volatileises: by the contact of flame it immediately takes fire, burning with a large white flame, and much smoke; if pure it is wholly consumed, without leaving any residue. When heated in a fipon, it diffuses into an oleaginous liquid.

There are two species of trees from which the camphor of commerce is procured. That with which Europeans are acquainted, is the bums camphora, a large forest tree, that grows wild in the islands of Borneo and Sumatra. Of this tree, the leaves, the fruit, and every other part, when bruised, give out a strong odour of camphor, and the wood is much sought after as a material for chisels, &c. because its peculiarly aromatic smell renders it impenetrable to ants and other destructive insects. The oldest trees in general contain the largest proportion of camphor, and it is reckoned a good sign if the natural crevices in the principal branches have for some time past yielded spontaneously a quantity of oil of camphor. The camphor itself is found in perpendicular veins near the centre of the tree, or concreted in the knots of the wood. The larger pieces are picked out with a sharp instrument, and the smaller ones are procured by means of mops, to which the camphor adheres, mixed with small bits of wood and other impurities. The flame tree yields also the oil of camphor, which appears to be a very fluid kind of resin, strongly fenching of camphor, and from which a considerable portion of this latter substance may be extracted by distillation. This oil exudes spontaneously from the older trees, but is chiefly procured by incision, in the following way: a cavity capable of containing about a quart is cut in the trunk, into which a lighted reed is introduced for about ten minutes, this draws the juices towards the cavity; which, in the space of a night, is completely filled with oil; the fame copious flow of juice continues for three nights longer, after which, by a fresh application of heat, a further but less plentiful supply is obtained.

In Japan are large forests of another species of laurus, which yields camphor, though not in such abundance as that which we have already described. In this tree the camphor is not contained in concrete masses, so that in order to procure it, distillation must be had recourse to. For this purpose, the roots and extremities of the branches, being cut into thin chips, are put into a net or upon a wooden framework, and founted within a kind of alembic, at the bottom of which is a little water: by the application of a boiling heat, the steam penetrates the contents of the net, and carries the camphor along with it into the capital, where it is deposited like snow on the rice straw with which the capital is lined.

The Sumatran camphor is much more esteemed in the East than the Japanese, from which it may readily be distinguished by its superior adhesiveness, in consequence of which, it is much less volatile than that which has been procured by distillation. All the camphor which comes to Europe is the produce of Borneo or Sumatra, and arrives in the form of irregular lumps of a yellowish grey-colour, which are fongy and very light, and when broken discover a crystalline granular fracture.

The purification of crude camphor is an art that is carefully kept secret by those who are in possession of it. Venice had formerly the monopoly of this manufacture, afterwards it was successfully practiced in Holland, and at present large quantities are refined by none of the English druggists. The process is understood to be very simple, and probably confits merely in mixing the crude camphor with chalk or lime, and subliming it as high a heat as can be safely applied. Spirit of wine has been proposed and employed on a small scale for the purification of camphor, but is insoluble, both on account of its expensive nature and being incapable of separating any residuum which the camphor may be dignified or accidentally mingled. Simple sublimed camphor differs from the refined camphor of the flaps in being of a hoary fpongy granular consistence like snow, but it may easily be made to assume the close and folidated textures of the latter, by simple folution in closed vessels.

Although the camphor of commerce is obtained only from the laurus camphora and a kindred species in Japan, yet its existence has been proved in many other species of plant. Thus the roots of the cinnamon tree (laurus cinnamonum) of the caña (laurus caña), of the lilafita (laurus jaffafras), may be made to yield real camphor by distillation, though not in sufficient quantity to balance the expense. The distilled water of balsam has been found to deposit crystals of camphor by long standing. It has also been discovered in the fresh roots of galanga, zedoary, and ginger, and in the seeds of cardamom and long pepper. It is probably contained in all the essential oils, and has actually been procured from those of juniper, fage, byflop, thyme, peppermint, rosemary, and lavender. The deposition of crystalline gums similar to camphor in old essential oils had been observed by many of the older chemists, but no important investigations took place in consequence of this discovery, till Proust took the subject in hand, and showed, from accurate and large experiments, that camphor may be profitably prepared from the essential oil produced in the southern countries of Europe.

This able chemist having accidentally observed that the essential oil of lavender, distilled in the province of Murcia in Spain, deposited a large proportion of camphor, and that the other essential oils of this district were remarkably fragrant, selected the essential oil of rosemary, marjoram, fage, and lavender, as the subjects of the following experiments. Equal portions of the four oils were placed in shallow earthenware vessels, and exposed to spontaneous evaporation at a temperature not exceeding 37° Fahn. and in proportion as the crystals of camphor were deposited, they were taken out and drained, and kept in well-stopped vials. By this simple process the oil of rosemary yielded 6.25 per cent. of camphor.

<table>
<thead>
<tr>
<th>Oil</th>
<th>Proportion of Camphor</th>
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<tbody>
<tr>
<td>marjoram</td>
<td>10.14</td>
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<tr>
<td>fage</td>
<td>21.06</td>
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<tr>
<td>lavender</td>
<td>25</td>
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The oil of lavender appears to be fully saturated with camphor, for although when heated it will take up about 5% of its weight more of this substance, yet it deposits by cooling a greater quantity even than it was made to diffusle. When exposed to spontaneous evaporation the filaments of camphor begin to appear in about twelve hours, and continue to be deposited till almost all the oil is evaporated. In the other oils the crystals are later in shooting, according to their relative proportions of camphor, and when about four-fifths of the oil are evaporated, the residue becomes thick, and ceases to deposit any more crystals. The camphor produced by each of these four experiments, being dried by slight pressure before filtering paper, was in dry almost pulverulent crystals as brilliant and almost as white as snow, and for little of the peculiar odour of the oil remained, that it was by no means easy to ascertain, from the smell alone, from what species of oil any particular parcel of crystals was obtained.

The proportion of camphor procurable from these oils depends,
camphor was made to boil, the produce of camphor will be considerably diminished, and part will sublime into the capital of the alembic. The camphor from oil of lavender, by either of these methods, is not absolutely pure, for when sublimed at a gentle temperature, it leaves behind a small portion of brownish retin still mixed with camphor. The most economical way of refining this camphor is to mix it with half its weight of chalk, or lime, or washed wood-ashes, and sublume it, by which operation it loses about $\frac{1}{2}$ of its weight. The produce of refined camphor, therefore, by spontaneous evaporation of the oil of lavender, amounts to about 2.4 per cent., and, by distillation, is equal to 19 per cent.; this latter method is, however, by far the most economical, notwithstanding the additional expense of fuel and apparatus, as it fuses both time and the oil, which would otherwise be entirely lost.

The production of camphor by the action of muriatic acid on oil of turpentine, is a discovery of very late date: it was first effected, accidentally, by M. Kneip, in preparing the arithritic liquor of Pott; the experiment was then repeated by Tammendorf with the same result; and, lastly, the Société of pharmacy at Paris being informed of these facts, nominated three of their members to repeat the investigation, and make a report on the subject; from which forerun the following facts are derived.

A small quantity of camphor may be obtained from oil of turpentine by simple distillation, provided the process is carried on sufficiently slowly. Eight ounces of this fluid were distilled in a glass alembic, at the temperature of about 124° F.; four ounces of very highly rectified essental oil passed into the recipient, and the capital was found lined with small crystals of real camphor.

This substance, however, is procured in much larger proportions by the affinage of muriatic acid. Four pounds of oil of turpentine were put into a Woolf's apparatus, and the retort being charged with an equal weight of decrepitated common salt, and half as much sulphuric acid, the whole of the muriatic acid gas that could be obtained by a moderate heat from these materials, was transmitted into the oil of turpentine, and wholly absoled by it. In consequence of this, the oil became exceedingly hot, and acquired a light lemon-colour, and towards the end of the process, a clear transparent brown, a small quantity of a thick oily fluid being gradually discharged and sinking to the bottom. The liquor being allowed to cool for twenty-four hours, was found converted into a thick crystalline mass, from which, when laid on a sloping surface, the brown liquor drained away. Being then wrapped in filtering paper, and subjected to moderate pressure, twenty-four ounces of a perfectly white crystalline matter were left behind of a peculiar odour, in some degree participating both of oil of turpentine and muriatic acid. The liquor which had drained from the crystals was put into a cold cock, and, in the space of a few days, was found to have deposited four ounces more of crystals, and two ounces additional were obtained by expelling it to a powerful freezing mixture. Thus four pounds of oil of turpentine yielded thirty ounces of crystals, or not far short of half its weight.

The crystals thus obtained required a dazzling white colour simply by washing them with water, but still retained a terebbinate odour; and the washings were acridulous to the taste, having taken up a little muriatic acid, but were also highly aromatic. Another portion of crystals being washed with a weak solution of per erectus, was found to resemble common camphor in its odour, that of turpentine having nearly disappeared. It was thought that sublimation would be more effected than washing, in purifying this camphor; accordingly, two portions of it were mixed, one with an equal weight of charcoal, and the other of quicklime, and were heated in glass alembics; the crystals soon became covered with radiating crystals of a brilliant white colour, entirely free from the terebbinate odour, and resembling that of camphor, only not quite so powerful. In this state it floats on the surface of water, and communicat to it a camphoric flavour, is very inflammable, soluable in alcohol, and precipitable from it by the action of water. Nitric acid acts upon it in the same manner as on East Indian camphor, but more slowly; but it appears to be wholly insoluble in acetic acid.

The presence of camphor having been shown in such a variety of substances, in all of which, when brought to the highest degree of purity, it appears to be absolutely the same, that it may be considered as one of the secondary vegetable principles; hence an inquiry into its chemical properties and composition becomes of considerable interest.

Camphor, on account of its volatility, requires to be kept in well closed vessels; it is not, however, by any means so easily evaporable as is generally supposed. According to Koenemulder, pulverized camphor spread thin and exposed to the air at a temperature not exceeding 52° Fah. does not lose more than half its weight in 16 weeks; the ratio of volatilization, however, rapidly increases with an increase of temperature. The moistness of the air also has a considerable effect, the loss of camphor being much greater in a humid atmosphere than in a dry one. The degree at which camphor melts is fixed by Venturi at 502 Fah., and by dividing a mass that has been slowly cooled in the direction of its lamina, it appears to crystallize in octohedrons.

Water has little or no action on camphor; at a boiling heat it takes up, however, enough to acquire both the odour and flavour of this substance. By the allusion of gum-mucilage or sugar it forms with water a whitish emulsion.

Alcohol at the usual temperature will take up between a seventh and an eighth of its weight of camphor, and when boiling it will dissolve half its weight, the greater part of which is again depoited by cooling. If equal parts of camphorized alcohol and sulphuric acid are distilled together, the produce is a camphorated ether, and a tenacious black resinous mass remains in the retort. Camphor is also copiously soluble in sulphuric, and probably in all the other ethers. When camphorized alcohol or ether is mixed with water, nearly the whole of the camphor separates in thick curdy masses, which, when dried, exhibit the camphor unaltered in any of its properties. Oils, both the expressed, the eential, and the emplastic, come here with camphor, and do the reflex and balancing. The hard and dry retins are converted by it into a soft tenacious mass, remarkably soluble in alcohol. The alkalies, whether in their caustic or carbonated state, have no action whatever on camphor, nor will they unite even when affixed with oil or fosp.

Sulphur and camphor will combine together by means of very
CAMPHOR.

very gentle fusion; the resulting mass is brittle when cold, but soft and tenacious when warm. The alkaline sulphates will also unite by fusion with camphor, and retain it when dissolved in water; the addition of an acid to this solution throws down the sulphur and camphor in a state of intimate combination with each other.

When set fire to in atmospheric air or oxygen gas, camphor burns with a copious white flame and black smoke, and is entirely consumed. A large quantity of carboxic acid and carbonated hydrogen is produced. The ultimate combination of parts of camphor appears to be carbon, hydrogen, and oxygen, but in what proportion is not yet ascertained.

Camphor when distilled per se is volatile; but if mixed with musk in the proportion of four parts of the latter to one of the former, and subjected to dry distillation, it is converted to a butyric acidness; and by a second distillation with an equal quantity of fixed oil is entirely resolved into a fluid colourless oil, and a small portion of watery acridulous oil, smelling strongly of camphor; the oil at the fame is reduced to a black sparkling powder being almost entirely deoxygenated. Clay, according to La Grange, produces the same effect. This oil of camphor, according to Kofegarten, is nearly colourless, has a peculiar odour like that of thyme and rosemary, and bears a close analogy to the efffluent oils. It is soluble in alcohol and separable unaltered from its solution by agitation with water. It forms favonules with the alkalies, and is easily volatile for the malt part by a gentle heat. Nitric acid produces no other effect than tinging it of a reddish colour, and even a mixture of this acid with the concentrated fulphur only deepens the colour of the oil still more, and brings it to a somewhat thicker consistence. Both vinegar and carboxic acid will distil a small portion of camphor. The muriatic and fluoric acids when in a state of gas take up a considerable quantity, but do not nearly the whole by the contact of water. Concentrated fulphuric acid distillos camphor largely even in the cold, but by the assistance of a moderate heat it takes up so much as to form a thick homogeneous mass, of a brown or black colour, and a sulphureous odour, which when warm is fluid, but coagulates by a moderate heat, and by evaporation is brought to a refrinous consistence. This is soluble in alcohol, but is decomposed by water, the camphor being disengaged with little or no alteration, and the mixture now longer exhaling a sulphureous but a camphoric odour. The action of oxymuriatic acid on camphorized sulphureous camphor is remarkable: if one part of camphor is disengaged in eight parts of sulphureous acid, and this mixture is poured in a retort upon four parts of black oxyd of magnesia and as much water, the result of a flow distillation of the materials will be acetic acid mixed with a small portion of unde-composed camphor.

Nitric acid, when somewhat concentrated, distillos camphor in considerable quantities at the usual temperature. The solution is of a very dilute yellow colour, and separates by sanding into two distinct liquids. The lower consists of a mixture of nitric and camphoric acids. The upper fluid is of the consistence of oil, and is called acid oil of camphor: it is a combination of camphoric and nitric acid. This oil is soluble in alcohol, but is decomposable with precipitation of the camphor by water or alkalies. The conversion of camphor into a camphoric acid was first practised by Kofegarten, and was afterwards more fully elucidated by La Grange.

The process of Kofegarten is the following: Put one part of camphor into a retort, with 12 parts of strong nitric acid, and distil it slowly to dryness: a large quantity of carboxic acid and nitrous gas is disengaged, and the acid in the receiver is covered with a thin film of acid oil of camphor; a small portion of camphor sublimes into the upper part of the retort, and the mass at the bottom of the vessel is camphor approaching to the state of a vegetable oxyd. It has no longer the peculiar odour of the original substance, and when laid on a hot coal it evaporates with some what of a resinous odour, but without undergoing combination: it is soluble in alcohol but not in water. This oxygenated camphor by being twice distilled to dryness, with ten parts of nitric acid at each process, is converted to a white phosphorous salt, soluble in hot water, and which has obtained the name of camphoric acid.

The method of La Grange differs chiefly in requiring a smaller quantity of nitric acid. He takes one part of camphor and four parts of nitric acid, and distil the mixture by a very gentle heat; the acid that passes into the receiver being mixed with four parts more of the same acid, is returned upon the matter in the retort and again distilled. This is repeated five several times with twenty parts of nitric acid in the whole, and the operation is known to be finished when the liquor in the retort crystallises on cooling. The produce of camphorized acid by either of these methods does not much exceed one half of the camphor made use of.

Camphoric acid, when crystallized hastily, appears as a mass of white fibrous filaments: but by slow cooling assumes the form of parallelopipedal or rhomboidal plates, which effloresce on exposure to the air. To the taste it is slightly sweet and bitterish. It reddens syrup of violets, and tincture of litmus. It diffuses easily in alcohol and in hot water, but requires 200 parts of this latter fluid at the ordinary temperature for its solution. When heated it gives out a thick aromatic smoke, and is entirely disintegrated in slow vessels it sublimes unaltered, if the heat is not too great. The alcoholic solution of this salt is not decomposed by water, a circumstance that distinguishes it from henzic acid, to which it bears a considerable resemblance. It is soluble in the expected and efffluent oils, and in the mineral acids, and forms a precipitate with the muriat and sulphat of iron.

Camphor acid unites with the soluble bases forming a genus of salts, the CAMPHORATS. Of these very little is known. The neutral and earthy camphorats, which are the only ones that have as yet been the subject of any experiments, are all decomposable by heat, except the camphorats of ammonium, which sublimes unaltered. When exposed to the blow-pipe, the acid burns off with a blue flame. The camphorats are decomposable with abstraction of the base by the mineral acids, and with abstraction of the acid by most of the metallic, barytic, and calcareous salts. The camphorats of lime, barytes, and magnesia, yield their acid to alcohol.

The use of camphor in the arts is to assist the solution of the resins in various menstrua. It is employed with success in cabinets of Natural History to prevent the approach of insects which appear to be stupefied and killed by the pungency of its odour. For its medical properties and application see the next article.

CAMPHOR. Medical uses of, and pharmaceutical preparations.

Camphor has long been considered as an article of high importance in the materia medica, and is in daily use for a great variety of purposes, in which its beneficial operation is unquestionable. Yet it is chiefly as an auxiliary that it is referred to, and though a valuable medicine, it does not appear to deserve the very high encomiums that have been given to it by many eminent writers.

In a moderate dose, camphor when taken into the bowels, (mixed with some vehicle which will allow of its being divided and distributed over this organ) increases the real heat of the body, though its first effect is often a sensa-
tion of colds. It soon produces a strong tendency to perspiration; but the pulse is not sensibly affected in quickness by a dose capable of producing copious sweat, and an elevation of spirits like the beginning of intoxication. In a febrile irritable state of body, accompanied with spasmodic affections of the muscles, camphor may be given with safety and advantage; and it acts very decidedly as an antispasmodic, and very materially affixes the action of opium. Experience shows that the action of camphor is sudden and very extraordinary, resembling in this respect that of the essential oils, only it must always be remembered that on account of the extreme solubility of this substance in most of the animal fluids, unless it be very minutely divided, it will remain long unaltered in the alimentary canal; and thus the same effect may in fact be produced by the length of time in which it remains in contact with the organs, as if its operation were highly permanent.

Experiments have been made both on the human body and on other animals with regard to the effects of camphor in excursive doses, which shewed it to be possessed of extremely active deleterious powers, and teach some caution in the use of this remedy. Camphor gives rise internally to small animals, such as birds, cats, dogs, &c. produced severe effects in all. The first operation appeared to be that of an excursive acid fluxus on the flamch, producing foaming at the mouth, violent convulsive twitchings over the body, sometimes with vomitings; accessions of fury in dogs and cats; symptoms resembling intoxication; and lastly, constofe stupor and death. On opening the body, the flamch was found violently inflamed, and the intestines dilated with wind and froth. Twenty four grains proved a pretty certain poison to cats. The effects of an over dose of this substance on the human body were accurately shewn by the experiments to this express object, which Dr. Alexander made on himself. On taking one scruple the pulse soon fell from 63 to 65; two scruples more gave a great and at first agreeable sense of warmth in the flamch, but soon followed by excessive anxiety and creeping of the flesh, nausea, gid-diness, tremors, convulsions, loss of recollection, and delirium, coma and quickened pulse. On drinking warm water, much of the camphor came up from the flamch three hours after it had been taken, and with very speedy relief, and the whole of the formidable train of symptoms brought on by this rash experiment subsided rapidly and left no permanent inconvenience.

To infect and very small animals, the effluvium of camphor, even at a common temperature, is obviously excessively harrowing, as they quickly avoid it; but if confined in a close vessel with a piece of camphor, it proves fatal to many species.

Camphor is a very powerful antifeptic; and from this and its stimulant powers, all the medicinal virtues attributed to it have been usually derived. Indeed, to the very great antiseptic power which it possesses, may be attributed the somewhat exaggerated praise which it has received as an internal medicine in the cure of typhus, and (so called) putrid fevers, in the fever attending local gangrene, and similar diatheses; for its efficacy in these is certainly not comparable to that of other medicines. In the typhoid diatheses attended with spasmodic motions of the limbs (at all times a most formidable symptom) camphor is peculiarly serviceable, and much affixes the action of opium. In rheumatic complaints or other disorders where a copious sweat is wanted, there are three medicines so certain as a mixture of camphor and nitre, about five grains of the former, and from 15 to 20 of the latter, taken at short intervals.

A very common, and generally cordial and grateful drink, (besides being a good vehicle for other medicines), is the

*majura camphorata, or camphor jube*, made by rubbing one dram of camphor first with a little spirit of wine to bring it to a powder, then with half an ounce of sugar, and adding a pint of boiling water. When cold, the water takes strongly and pleasantly of the camphor, though almost the whole seems at the top unmix'd; and so little camphor is diffolved that neither by evaporation nor by any other method can any visible quantity be extracted from the water. A very elegant preparation of camphor, often of singular use in spasmatic irritability of the flamch, and incessant vomiting, is a solution of camphor in water saturated with carbonic acid. If pulverized camphor is diffused in water in a Nouth's manner or any similar contrivance, the water as it takes up carbonic acid diffuses also a very small portion of the camphor, though it is doubtful whether it takes up in this way more than in the common camphor jube.

Almond emulsion with camphor diffused in it is a much stronger solution of this substance than the former preparations, the almonds much affixing the solution of the camphor. One scruple of camphor, (rubbed to powder, with a drop or two of alcohol), two drams of almonds, one dram of sugar and half a pint of water, make the "emulsion camphorata." It is used for the same intention as the camphor mixture, and it is also much employed as a drink in stricture, difficult micturition, the ardor urinis of gout, and other painful affections of the urinary organs. It is said that magnesia much affixes the solubility of the camphor in this emulsion, and is besides often an useful addition as a medicine.

Camphor and opium are very frequently joined both in the liquid and solid form. The commonest liquid preparation of the two is the "tinctura opii camphorata," or "elixir paragonicum," a medicine of undoubtedly utility in coughs, oppression of breathing, and many other complaints; and perhaps of all others the commonest, (and we may add, one of the safest and the best) of the domestic medicines. Camphor is thought peculiarly to counteract the heating and unpleasant effects of opium, and, together, to determine gently to the skin, and to allay spasmotic irritation. They may be well combined in the form of pills, but to divide the camphor and increase its solubility, it should be rubbed down with a drop or two of alcohol, or spirit of ammonia. A bolus is, perhaps, a better form, and the solubility of camphor in the flamch is further increased by being triturated with gum arabic.

Camphor is largely employed as an external application, sometimes as a stimulant and antifeptic conjoined, as where it enters into the composition of the fomentations of aromatic herbs used in gangrene or phaeacels; sometimes as a stimulant and supposed diuretic to indolent tumors, rigidity of tendons, and the like; sometimes as a simple stimulant, as for example, when used as a collyrium to chronic complaints of the eyes, &c.

Camphor for external use is diffused either in oily or in spirituous menstrua. Olive oil diffuses it largely, especially when pulverized and affixed by a gentle heat. The solution is quite limpid, and often greenish. It is a very valuable application of itself, or when brought into a kind of soap by spirit of ammonia. Palm oil with camphor, makes a common and very excellent liniment of the fomulentating and diuretic kind. It is yellow and of the confidence of butter. Marinated ammonia in very fine powder, rubbed with camphorated palm-oil, makes a most active and valuable liniment.

Camphor is often mixed with resinsous substances in the harder and compound plasters and ungueants. Here the apothecary should be aware of the remarkable power of camphor
diligence; his pencil was remarkably tender and soft; his
colouring a just representation of nature, and very transpa-
rent; and his perspective accurate and well contrived.
His pictures, as he left off painting at the age of 18 years, are
scarce, and fetch considerable prices. When he relinquished
his profession, he became tutor to the sons of lord Nieuport,
and was recompensed for his discharge of the trust with the
office of secretory to that nobleman. The designs which he
executed by drawing with a pen are highly valued. Til-
kington.

CAMPIAN, Edmund, a distinguished popular martyr
in the reign of queen Elizabeth, was born at London in 1550,
and brought up at Christ's hospital. He was admitted a
scholar of St. John's college at Oxford, in 1553, and hav-
ing taken his degree of M. A. in 1564, entered into orders,
and became an eloquent Protestant preacher. When queen
Elizabeth visited the university in 1566, he delivered an
elegant oration and kept an act in her presence, with
great applause. In 1567, he went to Ireland, where he
became a convert to popery; and upon being discovered in
making profelytes, he was apprehended. However, he
made his escape into England, and from thence into the
Low Countries, and entered into the English college at
Douay. At Rome he was admitted into the society of Je-
fnuits; and having been sent by the general of the order into
Germany, he at length settled at Prague, and for five years
taught rhetoric and philosophy in the Jefuits' college. Hav-
ing established his reputation for recovering to the church
many persons who had separated from it, he was recalled to
Rome, and deputed by Gregory XIII. in 1589, on the
dangerous mission to England. Here he was zealous in his
endeavours by his discourses and writings to make profely-
tes; and he procured to be printed at a private press,
and industriously circulated at Oxford, a kind of challenge
to the clergy, entitled, "Rationes decem oblati certaminis
in caufa fidei, redditae Academicae Angliae." After he
had for some time concealed himself, he was at length dis-
covered in disguise at the house of a gentleman in Berkshirve,
and conveyed to the tower in procession, with a paper affi-
thed to his hat, upon which was an inscription, "Edmund
Campian, a most pernicious Jesuit." Soon after, he was
convicted of a charge of high treason, and in December,
1581, he was hanged and quartered at Tyburn. None have
questioned his abilities, honesty, and moral character; and it
has been also allowed, that he was well skilled in the learn-
ing of his age and profecion. Among severall works, written
by him, were "An Universal Chronology" and a "Narra-
tive of the Divorce of Henry VIII. from his Queen Catha-
rine," both in Latin; and "Various Conferences on Re-
ligion held with Protestant Divines in the Tower of London."
Whilst he was in Ireland he wrote in 1570, two books of the
history of that kingdom, published by Sir James Ware,
at Dublin, in 1633. Wood's Athen. Oxon. Nicholson's

CAMPICURSIO, in the Ancient Military Art, a march
of armed men for several miles, from and back again to the
camp, to instruct them in the military pace. This exer-cise
was nearly akin to the descurfo, from it which only it differed,
in that the latter was performed by horsemen, the former
also by foot.

CAMPIDOCTORES, or CAMPIDUCTORES, in the
Roman Army, were officers who instructed the soldiery in
the discipline and exerceses of war, and the art of handing
their weapons to advantage. Thence are also sometimes called
campigeni and armillatores.

CAMPIDUCTOR, in Middle Age Writers, signifies
the leader or commander of an army, or party.

CAMPILIA, in Geography, a town of Italy, in the
duchy of Tuscany; 26 miles S. of Volterra.

CAMPILLO, a town of Spain, in the county of Se-
ville; three leagues W. of Antequera.

CAMPION, Francois, in Biography, one of the claim-
ants to the invention of the theory of perspective. It is recorded in Walter, that besides several useful elementary tracts for
the Theorbo and Guitar, in 1705, he published a treatise
on accompaniment and composition, according to the rules of
the octave, a work generally useful for transposition, to
all those who fluddy figuring and stringed (keyed) instruments,
or even a single base part, which it will inform them how to
figure.

Campion, in Botany. See Agrostemma, Cucuba-
lius, Lychnis, and Silene.

Campion, in Geography, a town of Tartary, which
was the capital of the kingdom of Tangut, or of the country
lying immediately to the N.W. of the Chinefe province of
Shensi, and formerly remarkable for being a place through
which the caravans passed in the road from Bucharia to China.
It is distant 60 miles N. from the great wall of China.
N. lat. 40° 27'. E. long. 104° 53'.

Campioni, in Biography, an agreeable French com-
poser of the Italian school, student in 1750 at Sienna;
whence removing to Florence, he was taken into the service of
the grand duke, and composed a Te Deum for the birth of
his imperial highness's eldest daughter, full of curious
anons and other ingenious contrivances, which was per-
formed by a band of 200 voices and instruments. But
though this composition was with propriety written alla Pa-
 federio, his printed tritos were in the modern Italian style,
and in great favour in England, for more than 10 years,
during the middle of the last century. They were in an
easy and graceful taste, and pleased universally till the su-
perior force and genius of the elder Stamit and Boccherini,
created new wants and expectations.

Campion, in Botany. See Agrostemma, Cucuba-
lius, Lychnis, and Silene.

Campstron, John Gualseert, a French dra-
matic writer, was born at Toulouse in 1636, and mani-
festcd an early taste for poetry. Being discouraged from indul-
ging in by his friends, he abruptly left them, and went to
Paris, where he put himself under the direction of Racine.
His first compositions were two tragedies, entitled "Vir-
ginia" and "Arminius," which were followed by two others of
superior merit and more permanent reputation and popu-
arity, viz. "Andronicus" and "Alcibiades." He was
recommended by Racine to the duke of Vendome, as a pro-
per person for composing a new opera for a magnificent festi-
vial which he was preparing to give to the dauphin. The
piece produced on this occasion was the heroic pastoral of
"Acis and Galatea," which being the means of introducing
him to the duke, laid the foundation of his fortune. The
duke, engaged by his talents for conversation and convivial-
ity,
CAMPILHON, tired at length, both of the camp and the court, withdrew to his native city, of which he was appointed, in 1701, "Capitoul," or chief magistrate, and in the same year he was admitted a member of the French academy. In 1710 he married, and palled the remainder of his life in the circle of his family and friends. His death was occasioned by an apoplexy in 1728. Besides the dramatic pieces already mentioned, he published several others, among which are his "Phœnix," "Adrian," "Tridates," "Pharnaces," and "Jaloux défahû;" and these contributed to support the reputation of the French theatre, though in an inferior degree, after it had lost Corneille and Racine; neither of whom he could rival. His style, however, was pure, natural, and sometimes elegant; but his distinguishing excellence consisted in the disposition of his plots, the modelling of his characters, and the knowledge of stage-effect. Nine editions of his "Theatre" were printed at Paris during his life; but the last and best was published since his death, in 1750, in 2 vols. 12mo. His brother, Louis Campilhon, was a Jesuit, and cultivated French poetry. He also wrote funeral odes on the death of Louis XIV. and the death of his friend. He died in 1733, aged 77. Moreni. Nouv. Dict. Hist.

CAMPILHON, See CHAMPART.

CAMPITAE, in Church History, an appellation given to the Donatists on account of their assemblding in the fields for want of churches. For a similar reason, they were also denominated Montenfas and Rupitanis.

CAMPITELLO, in Geography, a town of the island of Corfica; 14 miles S. of Balia.

CAMPÓ, a town of Italy, a sief of the empire, in the state of Genoa; 13 miles N.W. of Genoa.

CAMPÓ Basso, a city of Naples, and capital of the Molise, seated in a fertile plain, producing all the necessaries of life. The air is delicious, and the inhabitants, estimated at about 6000, carry on a considerable trade in articles of cutlery.

C. F. G., a town of Naples, in the province of Abruzzo Ultra.

C. L. I., a town of Naples, in the county of Molise; 14 miles E. of Molise. — C. Magnes, a town of Naples, in the province of Bafclica; 14 miles S.E. of Acrenen.

Alfo, a town of Italy in the Tortones, belonging to Piedmont.

C. Marino, a town of Naples, in the province of Capitanata; 3 miles S.E. of Termoli. — C. Maresc, a town of Genoa, deriving its name from the quantity of mulberries growing in its vicinity; 11 miles N.N.W. of Genoa.

C. Mayor, a fortified town of Portugal, in the province of Alentejo, containing about 3500 inhabitants; 10 miles N.W. of Badajos in Spain. N. lat. 38° 50', W. long. 7° 24'. — C. Marlo, a place of Italy, in the duchy of Perugia, near which Hannibal is said to have defeated the Romans. — C. St. Pietro, a town of the state of Venice, in the Paduan; 13 miles N. of Padua.

CAMPOBELLO, a town of Sicily, in the valley of Mazara; 14 miles N.E. of Giurgiuto.

CAMPÓ-BELLO, a long and narrow island on the east coast of Washington county, in the district of Maine, in America, and the north-easternmost of all the islands of the district. The north end of this island lies in about N. lat. 44° 48'. The south end is 5 miles north-Weyster from Grand Manan island.

CAMPOCHIARO, a town of Naples, in the county of Molise; 11 miles S. of Molife.

CAMPOLI, a town of Naples, in the province of Abruzzo Ultra; 3 miles N. of Teramo. N. lat. 42° 8'. L. long. 15° 55'.

CAMPOLONGO, AEOLIUS, in Biography, born at Padua in 1550, and applying early to the study of medicine, attained such eminence as to be noticed, and employed by the first families in the city; and in 1573 to be appointed professor in that science, an office he continued to hold till the time of his death in 1621. The principal of his works are, "De Variola, et de Arthrifite," 1450; taken principally from the works of Galen, in which he was intimately conversant. "Methodi Medicinales," conjointly with Alb. Botutto, 1880. "Nova cognomographia Morbor Methodus," 1601, 8vo.; and after his death, from his papers. "De Lue Venere, Libellus," Padua. 1635, lat.; and "De Verminibus, de Usuris Affildibus, et de Mortis causis," 1636. Alfr. de Morb. Ven. Halfer, Bib. Med.

CAMPOMACHIA, in Botany, Bofe Nouveau Dict. Flor. Peruv. Clufs and order, veftens monogynea. Nat. ord. Hepperdes. Linn. Myth. Jul. Gen. Chi. Cal. perianth five-leafed, permanent: segments egg-shaped. Cor. petals five, egg-shaped, concave. Stam. numerous, inserted on the calyx. Pfl. germ inferior: style inclined: stigma target-shaped, umbilicated. Fere. berry globular, compressed, one-celled, crowned with the style. Seeds about twelve, kiney-shaped, attached to a filicous receptacle. A tree found in Peru, of which no further details are given. Bofe observes, that it is an intermediate genus between Myrtus and Pifium, and that it appears to agree with Decasperum, a genus transformed by Flurler, for a plant which has since been received as a Pifium. The present plant, perhaps, ought to be admitted into the same genus. The form of the style, and the manner in which the seeds are attached to the receptacle, seem to constitute the only difference. To ascerten what ought to be the precise boundaries of a genus, and to determine what particulars, in the structure of the parts of fructification, should be considered as solid generic distinctions, is a problem which has not hitherto been, and probably may not be, resolved for many ages yet to come.

CAMPORA, in Geography, a town of Naples, in the Principato Cita; 15 miles N.W. of Poliastro.

CAMPRA, ANDREW, in Biography, a French musician, born at Aix, in 1663, settled at Paris in 1667, and first became known by the composition of motets for the churches and private concerts. He afterwards devoted his talents to compositions for the opera, and almost rivalled the celebrated Lulli. He set a number of ballets and serious operas, which are still occasionally performed; and also published various kinds of music, which have been held in estimation. The king appointed him music-master of the royal chapel, and gave him a pension. He died at Versailles in 1744. Moreni.

CAMPREDON, in Geography, a town of Spain, in the province of Catalon, at the foot of the Pyrenees, taken by the French, who destroyed its fortifications in 1651, and again in 1704; 27 miles N.N.W. of Gerona. N. lat. 42° 29', W. long. 2° 56'.

CAMP-SHEETING, CAMP-lot, or CAMPESTEAD, In Island-Navigntion, denotes a facing of piles and planks in the front of banks of wharfs, to prevent the banks being worn away.

CAMPSES, in Botany, (Loureiro). See INCARNILEA.

CAMPTON, in Geography, a small township of America, in Grafton county, New Hampshire, situated on the east bank of Pemigawaset, the north head water of Merrimack river; 67 miles N.W. of Portsmouth. It was incorporated in 1761, and contains 395 inhabitants. N. lat. 43° 57'.

CAMPUGIALI, in Geography, a town of the duchy of Tuscany; 9 miles W.N.W. of Arezzo.

CAMPUS, in Antiquity, a field or vacant plain in a city not
not built on, left vacant either on account of floods, combats, executions, or other ills of the citizens.

Campus Martius, in Ancient Geography, an anniversary assembly of our ancients, held on May-day; where they con- federated together for defence of the kingdom against all its enemies.

Campus Martius, a large plain field in the suburbs of ancient Rome, lying between the Quirinal and Capitoline mounts, and the Tiber; thus called because consecrated to the god Mars, and set apart for military sports and ceremonies, to which the Roman youth were trained; as the use and handling of arms, and all manner of acts of activity. Here the races were run, either with chariots or single horses; here also stood the sella publica, or palace for the reception of ambassadors, who were not permitted to enter the city. Many of the public consular were held in the same field, part of which, for that purpose, was cleaned out. The place was also noble decorated with statues, arches, columns, portraits, and the like structures.

Campus Martius is also used in a more general sense by Middle Age Writers, for any large plain open place near a great city, wherein the inhabitants were trained to the exercitium of arms. Of such we find mention at Verona, Tries, Dorne, and even Constantinople.

Among the French, campus maritius was an appellation given to the yearly assemblies of the people called by the kings, either for enacting new laws, or deliberating on the great affairs of the nation. They were thus denominated, either because usually held in the month of March, or in imitation of the campus maritius of the Romans, which was allotted for the like use. In aftertimes they were called campus major, and by corruption, campus maritus, and magialis, became the time of holding them was altered by Pepsin to the month of May. Under the third line of kings, their assemblies took the denomination of rates-general, state general.

Campus Soredere, a place without the walls of ancient Rome, where the vellals, who had violated their vow of virginity, were buried alive. See Burying alive.


Gen. Ch. Cal. perianth tubular, hairy, tubercled; border five-lobed; segments unequal. Cor. monopetalous, tubular, bilabiate; upper lip awl-shaped; lower lip egg-shaped. Stem. Filaments five, unequal. Fil. germ superior; stigma five-lobed. Peric. capsule nearly globular, five-celled, many-seeded.


Camrup, in Geography, a district of Alagam, (which see) on the isle of 'Daciancloth, situated between three high mountains, at the distance of four days' journey from Cherong. It is remarkable for bad water, noxious air, and confined prospects. It was the part to which the raja banished those of his subjects with whom he was angry.

Camtoos, a river of southern Africa, on the south coast of the colony of the Cape of Good Hope, formed by a collection of waters from the same part of the country with that of the Gaviret river (which see), but somewhat more calmer. It falls into a wide bay of the same name, in which the only secure anchorage is opposite to the mouth of a small stream called the "Kromme," or crooked river. Though Camtoos river, just within the mouth, is a wide bason, deep enough to float a ship of the line, yet the bar of sand across the mouth is fordable upon the beach at high water, and frequently dry at low water. Barrow's Africa, vol. ii.

Camudolanum, in Ancient Geography. See Camulodunum.

Camul, in Geography, a town of Tartary, at the extreme of the kingdom of Chuls, and on the borders of that of Tungut. N. lat. 67° 15', E. long. 157° 5'.

Camulodunum, in Ancient Geography. See Camulodunum.

Camunium, in Botany. See Muraya Exotica.

Camunlodunum, in Ancient Geography, a town of Albion, aligned by Prolemy to the Brigantes, and placed by Horalph at Orchard, near the river Calder, in Yorkshire, but Camden and Baxter place it near Almondbury, about six miles from Hulian, on the same river. Roman antiquities have been found at both these places, and there are still visible vestiges of walls and ramparts. It seems to have been the same with the Cambodunum of the Itinerary of Antonine in the second route, between Calcara and Tadcaster, and Man- nucium or Manchester.

Camuri, in Botany, one of the synonymous names of Dioscor Hystrix among old writers.

Camus, probably derived from ."Cone, I bend, a person with a low, flat nose, hollowed or sunk in the middle. The Tartars are great admirers of camus beauties. Rubruquis observes, that the wife of the great Genghis Khan, a celebrated beauty, had only two holes for a nose.

Camus, John-Peter, in Biography, an eminent French prelate, was born at Paris in 1582, and nominated by Henry IV., on account of his distinguished reputation, to the bishopric of Bellay, before he had attained the canonical age, to which he was consecrated in 1609, having previously obtained a dispensation from the pope. His attacks on the Mendicant orders, for their indolence and relaxed discipline, both from the pulpit and the press, were so acrimonious and fever, that the monks applied to cardinal Richelieu, in order to obtain a cessation of hostilities. His mode of attack, and style of preaching, may be discovered in the following passages, extracted from his sermons. "Father," says he, in a discourse delivered before the Cordeliers on St. Francis's day; "Admire the greatness of your saint; his miracles surpass those of the Son of God. Jesus Christ, with five loaves and three fishes, only once in his life, fed 5000 persons: St. Francis, with an ell of cloth, by a perpetual miracle, feeds daily 40,000 flagellants." "My friends," such was his delicate desire; on another occasion, a young gentleman is recommended to your charity, who is not rich enough to make a vow of poverty." The bishop, with a view of checking the ardour for reading romances, which prevailed in his time, and of directing it to some useful purpose, composed a number of rival works of a pious nature and tendency, which in some degree answered the purpose. After performing his episcopal duties with zeal and diligence for 20 years, he resolved to withdraw from the world; and having obtained leave to resign his bishopric, he retired first to the abbacy of Aulney, and afterwards to the hospital of Incurables at Paris, where he died in 1652, after refusing two considerable bishoprics. Camus was distinguished by a lively and warm imagination; and he composed with wonderful facility, in a style that was partly grave and partly burlesque, abounding with figurative metaphors and images, often striking and sometimes hideous. He is said to have written 200 volumes, consisting of homilies and treatises, moral and devotional, pieces against the monks, pious novels, pastoral directions, &c.

His works, that are now read are; "L'Esprit de S. Francois de Sales," 6 vols. 8vo. reduced to one by a doctor of the Sorbonne; and "L'Avouement des ProtEans avec l'Eglise Romaine," republished in 1703 by Richard Simon, under the title of "Moyens de reunir les ProtEans avec l'Eglise Romaine." Simon asserted, that Bossuet's explication
position of the Catholic faith was no more than this work in a new dress. Materi. Nom. Diet. Hist.

Cana, Stephen s, a French prelate, distinguished by his penitence, mortification, and attention to the duties of his profession, was born at Paris in 1632, and became a doctor of the Sorbonne in 1650. In early life he was borne away by the torrent of court dilapidation; but relieved on reformation, he was nominated by the king in 1671, after having been his abuser for several years, to the bishopric of Grenoble. His general conduct corresponded to the outward tokens of penitence which he manifested. "He always wore a rough hair-suit and lay down. He rose at two in the morning, recited his breviary, read the Scriptures, and at five called up a domestic who wakened the others. At half past five he read the common prayers, recited prime at six, and then said mass. He then retired to his closet till nine, when he gave audience. At eleven he dined with his household. His chaplain sat next him; and at another table were his steward and domestics. One of the laquays read. To the prelate were served legumes only, with a small measure of wine, half of which was reserved for the defert. He went to rest at eight. Such was the mode of living of this man, who was a prince as well as a bishop." Some time before his death, when his bodily infirmities increased, an order was procured from the pope to add fish and flesh to his diet. In visiting his diocese, for which he devoted three months in every year, he commonly travelled on foot; and visiting 100 parishes in a year, he completed his tour of the whole in three years. He everywhere preached with the same zeal, and distributed alms to the utmost extent of his revenue. He founded a number of charitable establishments. In 1686 pope Innocent XI., from a mere regard to his virtues, advanced him to the cardinalate. He died in 1707, and made the poor his heirs. His publications were Pastoral Letters to his Clergy, a collection of excellent Synodal Ordinances, and a Disputation in proof of the perpetual virginity of the virgin Mary. Moreri.

Camus, in Ancient Geography, a town of Asia, placed by Polybius in C celebrity.

Camius, in Ancient Geography. See Camiro.

Can, in Sc Languag. A pump's can, is a sort of wooden jug or pitcher, wherewith scamen pour water into pumps to make them work.

Can-bury. See Buoy.

Can-book, an instrument used to sling a caulk by the ends of the slates; it consists of a broad and flat hook fixed to each end of a short rope, and the tackle which serves to hoist or lower it is fastened to the middle of the rope.

Cana, in Entomology, an European species of Apis, of a grey colour, with the legs of the abdomen edged with whitish. Muf. Le£.

Cana, in Ornithology, a species of Motacilla, of a cinnereous colour; with the quill feathers edged with whitish; tail feathers black, the exterior ones nearly all white. Gmel. &c.

Obs. This is the grey-throated warbler of the Arctic Zoology. Buffon calls it Figuier cendrè à gorce cendrée. It inhabits Louisiana.

Cana, in Ancient Geography, the name of two cities of Galilee in Palestine; one called by Jerom Cana the Greater; the other, Cana the Lesser, or commonly Cana of Galilee. The former is mentioned by Joshua (chap. xix. 28.) and was situated in the tribe of Asher; the latter, which is more frequently mentioned in the sacred writings, (See John ii. 11. iv. 46. xxii. 2.) was feated in the tribe of Zebulun, N.W. of the sea of Galilee or of Tiberias, or the like of Geumafeth, on the confines of the upper and lower Galilee. This was the country of the apostle Simon, hence called the Canaanite (Matt. x. 43.) and of Nathaniel (John xxii. 3.) here Jesus wrought his first miracle; and as it was situated to the north of Capernaum, he is said to have gone down from Cana to this city; and after his return thither, the nobleman whose son was sick at Capernaum visited him there. It is of this Cana that Josephus speaks in his Life: p. 1057 and 1239.

Cana, or Canaan, a town of Palestine in the tribe of Ephraim, according to Encephus and Jerom; and also a river of the same name on the western limit of the territory of the Ephraimites. John. xvi. 6. xviii. 9.

Cana, a promontory of Aoln, with a small town and mountain adjoining it, at the termination of the bay of Adventistum.

Cana, a town in Culefria. See Canath.

Cana, in Geography, one of the smaller western islands of Scotland, about 8 miles S.W. from the island of Skye. N. lat. 5° 19'. W. long. 6° 10'.

Cana, El, a town of Asia Minor, in the province of Aladhas; 36 miles S. W. of Maltasia.

Canaan, in Scripture Biography, the fourth or youngest son of Ham, according to the order in which his name is introduced in Genesis, ch. x. 6. The Hebrew word Canaan is derived from כנן, to humber or abase, and with the prefix כannah it denotes a merchant or trader, as the Canaanites or Phcenicians were. If we join the נ and ר or אב and א into one syllable, and pronounce it as the Jews do, the word will be Canaan, and it will more nearly resemble the Chn of Sanchoniatho and Stephanus Byzantinus. The time of his birth and the length of his life are not known; but some have supposed that he was born in the ark during the period of the deluge, and it has been fancifully said that he was a wicked man, because he was the fruit of an unfeemly incontinence. The irreverent action of Ham in discovering the nakedness of his father Noah was retaliated on Canaan. 'To this purpose Noah, with the spirit of prophecy, pronounces his malediction on this branch of his posterity, "Curfed," says he, "be Canaan; a servant of servants shall he be unto his brethren." Gen. ix. 25. As this curse was denounced, not against Ham the immediate transgressor, but against his sons, who does not appear, from the words of Moses, to have been at all concerned in the crime, many conjectures have been employed to solve this difficulty in the sacred history. Some commentators apply the term כנן, or younger son in ch. ix. 24. to Canaan; and imagine that he joined with his father Ham in this mockery and insult upon Noah; and the Jewish rabbins have a tradition, that Canaan was the first who faw Noah in this posture, and then went and called his father Ham and concurred with him in his act of irreverence. Origen in Genef. p. 32. vol. ii. ed. Bene dicci. Bocharti Phaleg. l. iv. c. 37. col. 308. But this is a very arbitrary and unfounded method of interpretation; because no previous mention was made of Canaan, and of what he had done, but only of Ham the father of Canaan; and of him, therefore, the phrase of "little son" or "youngest son" must be understood. Others have alleged, that this curse was so far from being pronounced upon Canaan for his father Ham's transgression that it was not pronounced for his own, nor was it executed several hundred years after his death. It is in reality to be understood not so properly of Canaan, as of his descendants, the Canaanites. Accordingly, it is said, that God, foreseeing the wickedness of these people, which began with their father Ham, and greatly increased in this branch of his family, comminished Noah to pronounce a curse upon them, and to devote them to
the fervitude and misery, which their more common vices and iniquities would deserve. It is added, that this account was written by Molos for the encouragement of the Israelites, to support and animate them in their expedition against a people, who by their sins had forfeited the divine protection, and were destined to slavery from the days of Noah.

Some biblical critics have proposed to correct the text, supposing that Canaan is here erroneously placed for Ham, which is the reading of the Aldine edition of the LXX. and of 7 of Holms MSS. Others suppose that ΛΝΕΝ, ΛΝΕΗ, Ham the father of, are wanting before Canaan, and supply them accordingly; partly from the Arabic version ΛΝΕΗ, and partly from the rules of Hebrew metre, laid down by bishop Hare; ΛΝΕΗ being necessary to fill up the verse. But neither of these authorities, says Dr. Geddes, is sufficient to justify an alteration in the present text, in which there is no variety of reading either in the Samaritan or Hebrew copies, and with which all the other ancient versions perfectly agree. Besides, if this alteration were allowed, it would not much mend the matter; for if Ham was only to be curbed, why curfe him under the denomination of the father of Canaan. The text, in Dr. Geddes's opinion, is sufficiently clear as it stands; and highly expressive of what we may suppose to have been the feelings of Noah on this occasion. On awakening, he learns that Ham had used him most irreverently, while his other sons had shewed him that filial regard which was due to such a venerable father. To express his indignation at so infamous a conduct, he curfe Ham in his progeny, and in him of his progeny, who was, probably, most dear to him, as being his youngest son, perhaps just then born; and whose very name, which imports the idea of depreffive humiliation, might readily offer a paronomasial allusion, so common in the malédicitions and benedictions of the patriarchs. Dr. Geddes proceeds with reflections which we can by no means approve, and which, in our opinion, are altogether unnecessary to vindicate this part of the Scripture history. "Whether this malédiction," he says, "were prophetic or imprecatory; whether it were really made by Noah, or whether the whole be not a poetiform talle, contrived by the Hebrew historiographer for the purpose of throwing an odium on the Canaanites, and justifying the conquest of their country; are points which I mean not now to discuss: but it is pretty clear, that the story, true or false, is here introduced, to pave the way for a more special command from heaven to conquer and extinguish the Canaanite nations." See CANAANITES.

The curse pronounced by Noah on Canaan was peculiar to this son of Ham and his posterity, and does not seem to have extended to the rest of his brethren. And, indeed, considered as a prophecy, the declaration that Canaan "should be a servant of servants to his brethren," seems to have been wholly completed in him, though its accomplishment was dull and gradual. It was completed with regard to Shem, not only because a considerable part of the seven nations of the Canaanites were made slaves to the Israelites, when they took possession of their land, as part of the remainder of them were afterwards enslaved by Solomon; but also by the subsequent expeditions of the Affrians and Persians, who were both destined from Shem; and under whom the Canaanites suffered subjection, as well as the Israelites; not to mention the conquest of part of Canaan by the Elamites, or Persians, under Chedorlaomer, prior to them all. With regard to Japheth, we find a completion of the prophecy, in the successeive conquest of the Greeks and Romans in Palestine and Phoenicia, where the Canaanites were settled; but especially in the total subjugation of the Carthaginian power by the Romans; besides some invasions of the northern nations, as the poffersity of Thugarmuth and Maccob; wherein many of them were, probably, carried away captive. "Egypt," says Bishop Newton, "was the land of Ham, as it is often called in Scripture; and for many years it was a great and flourishing kingdom; but it was subdued by the Persians and afterwards by the Greeks, and it has ever since been in subjection to some or others of the poffersity of Shem or Japheth. The whole continent of Africa was peopled principally by the children of Ham; and for how many ages have the better parts of that country lain under the dominion of the Romans, and then of the Saracens, and now of the Turks? In what wickeds, ignorance, barbarity, slavery, misery, live most of the inhabitants? And of the poor negroes how many hundreds every year are sold and bought like beasts in the market, and are conveyed from one quarter of the world to do the work of beasts in another?" "Nothing," says this prelate in the clofe of his account of this prophecy, "can be more complete than the execution of the sentence upon Ham as well as upon Canaan."

Canaan is supposed to have lived and died in a country called after his name. His posterity was very numerous. His eldest son Sidon founded the city of Sidon, and was the father of the Sidonians and Phoenicians. His ten other sons were the fathers of as many tribes, dwelling in Palestine and Syria; viz. the Hittites, Jebusites, Amorites, Gerges, Hivites, Arkites, Sinites, Arvadites, Zemarites, and Hamathites.

Canaan seems to have been known to the ancient heathens. Sanchoniatho occasionally mentions Canaan, who is known to be Canaan, as the first Phoenician. There is reason to think, says the learned Bryant, that the Egyptians and other neighbouring nations, Canaan was expreffed Canaan. This by the Greeks was rendered ΚΑΝΑΑΟΝ, and ΚΑΝΑΑΟΣ; and in later times ΚΑΝΑΑΟΝ, Cnaa. Bryant adds, that, by prefixing the term ΚΑΝΑΑΟΣ, which is to be found in the composition of many words, particularly such as are of Amonian original, Cnass, or Canaan, was signified Ur-nas, and the Gentile name or pollef- tary was ΚΑΝΑΑΑΟΣ, ΚΑΝΑΑΑΟΣ, which was changed by the Greeks into ΚΑΝΑΑΟΣ, of Cussans; and from ΚΑΝΑΑΑΟΣ they formed ΚΑΝΑΑΑΟΣ; hence he derives the Cynus of Lucian, and the ancient poet, who was represented as the father of Phaethon and transformed into a swan. With regard to Cynus and his brotherhood, the vocal ministers of Apollo, the story, as he conceives, which is told of them undoubtedly alludes to Canaan, the son of Ham, and to the Canaanites, his posterity. Accordingly he observes, that the swan was the emblem of Canaan, as the eagle and vulture were of Egypt, and the dove of Babylonia; and that, wherever we may imagine any colonies from Canaan to have settled and founded temples, there is some story about swans. The Canaanites, it is said, wherever they came, introduced their national worship; part of which consisted in chanting hymns to the honour of their country god, who was the same as Apollo of Greece; and on this account Lucian, in compliance with the current notion, says, that the Cyni were formerly the allenns and ministers of that deity. By this, says Bryant, we are to understand, that people of this denomination were in ancient times his priests. Mede's works, vol. i. p. 378. Anc. Un. Hist. vol. i. p. 88. Geddes's Crit. Rom, vol. i. p. 76. Bishop Newton on the Prophecies in his works, vol. vii. p. 11—23. Sve. Leland's Deitical Writers, vol. iii. p. 254, &c. Bryant's Anal. Anc. Mythol. vol. i. p. 369, &c.

Canaan, land of, in Scripture Geography, so named from Canaan,
Canaan, the son of Ham, whose posterity possessed this country as well as Egypt, or Mizraim, lies in the western part of Asia, and extends from about 31° to 33° 20' N. lat. and from 34° 50' to 37° 15' E. long. It was bounded, to the north, by Cade-Syria, or the mountains of Libanus and Anti-Libanus; to the south, by the Mediterranean sea; to the south-west, by Arabia Deserta; and to the south and south-west, by Arabia Petraea and Egypt. Its extent has been variously ascertained; but from the late and most accurate computation, it was about 200 miles from north to south, that is, from Dan or Caesarea-Philippi to Beer-sheba, and about 100 miles in breadth. According to this reduced extent, if we consider its extraordinary fertility, the number of its inhabitants, and the many cities and villages which it contained, it was so far from being an inconsiderable spot of ground, as some have misrepresented it, that, exclusive of what it was in the reign of David and Solomon, (Ezra, iv. 20.) and many ages after, it must have been always regarded as one of the most opulent and considerable kingdoms of the East; and it must be allowed, that the Israelites, according to the acknowledgment of the king of Tyre, (1 Kings, v. 7.) were a "great people." Indeed, the description of its wealth, power, and population, seems very extraordinary; even allowing it to have been cultivated with the utmost diligence, by men well acquainted with every branch of agriculture.

Before the Israelites obtained the possession of it, Moses defended it as a country fitly called fertile and productive. See Deut. viii. 7. &c. Its wonderful fecundity was owing to several circumstances: such as the excellent temperature of the air, which was never subject to excessive heats or colds, the regularity of its seasons, especially the former and latter rain, and the natural fertility of its soil, which required neither labor nor manuring. It was famous for its large and delicious grapes, for its palm-trees, and its dates, for its balsam fir, which produced the celebrated balm of Gilead, for the constant verdure of its fruit trees, and for its citrons and its oranges. Its vines yielded grapes twice, and sometimes thrice, in a year; its honey was abundant; its inhabitants cultivated sugar-canes with great affluence; and their cotton, hemp, and flax, were mostly of their own growth and manufacture. Its vicinity to Libanus afforded them an ample supply of cedars, cypresses, and other flax and fragrant trees. They fed large herds of cattle, both great and small, and their hilly country afforded them not only a variety and plenty of pasture, but also of water, that deflected themselves into the valleys and lowlands, which it fertilized. But the most fertile, fertile-ground, were on the edge of the river Jordan, besides those of Sharon, or Sarona, the plains of Lydda, Janamia, and some others, which were then justly famed for their fecundity. As for fish, their rivers, the lake of Tiberias, and the Mediterranean sea, afforded great plenty and variety. The lake Alphænites yielded abundance of salt, with which they seasoned and preserved their fish, and which Galen affirms to have been preferable to any other. It ought further to be considered, that the country was then inhabited by an industrious people, who knew how to improve every inch of this land, and had made even the most desert and barren places to yield some kind of produce, by proper care and manuring, so that the very rocks, which now appear quite naked, produced corn, pulse, or pasture; for every little hillock was formed into a terrace covered with mould, which, through the laziness of succeeding proprietors, has been since washed off by rains and storms. The fecundity of Palestine hath been extolled even by Julian the apostate, a sworn enemy to Jews and Christians, who frequently, in his Epistles, mentions the perpetuity, as well as excellence and great abundance of its fruits and produce. The visible effects of divine displeasure, which this country has felt, not only under Titus Vespasian, but much more frequently that emperor's time, in the inundations of the northern barbarians, of the Saracens, and of the more cruel and destructive Chiliasm, during the holy war, and in the oppression it now feels under the Turk's yoke, are causes more than sufficient to have reduced the far greater part of the country into a mere desert. If we were to judge by its present appearance, nature itself has rendered it incapable of cultivation.

The land of Canaan was divided into two unequal parts, of which the western was considerably the greater, by the river Jordan, which rises in the mountains of Hermon (a branch of the mountains of Libanus,) and running south through the lake of Gennesaret, or the sea of Tibersias and Gilece, after a course of 150 miles, loses itself in the Alphænite Lake, or the Dead Sea. See Alphænite Lake.

The country to the east of Jordan was given to the tribes of Reuben, Gad, and the half tribe of Manassish; the kingdom of Moab lay to the south; the kingdom of Ammon to the coast of Gad; and the mountains of Hermon bounded Manassish to the north-east, beyond which lay Trachonitis and Idumæa. Weft of the Jordan, to the north, were placed Naphthali on the river, and Apher, which bordered on Phœnicia and the Mediterranean. Zebulan and Issachar had inland districts; but the other half tribe of Manassish and Ephraim reached from the sea to the river. Dan (upon the coast) and Benjamin, were south of Ephraim, and north of Simeon and Judah. The country allotted to Simeon bordered upon the Mediterranean, and extended to Egypt; but the Philistines, who inhabited the coast, were never entirely driven out of their possessions. The country of Judah bordered upon the Dead Sea, which separated it from the kingdom of Moab (for both Simeon and Judah lay considerably more south than the tribe of Reuben), and adjoined the mountainous country of Idumæa, or Edom, and Arabia Petraea, to the south. The next remarkable division, next to the distribution, by lot, among the twelve tribes, was made by king Solomon, who divided his kingdom into 12 provinces, or districts, each under a peculiar officer; but the most fatal division of all was that which obtained under his immediate son Rehoboam, when ten of the twelve tribes revolted, under the conduct of Jeroboam, who became head of this new monarchy, lilyed the kingdom of Israel, in opposition to that of Judah, the title which distinguished the named kingdom of Rehoboam, from that time downwards. Under the second temple the distinction lasted a considerable time, and the same imaginary hatred and hostilities continued between these two kingdoms; that of Israel taking the name of Samaria, from its capital. See Samarla.

After the return from the Babylonian captivity, the eastern division of the land of Canaan was called Peræa (more properly the country which had belonged to Reuben and Gad, for the northern part, sometimes called Gaulonitis, was included in the district of Trachonitis), and the western part was divided into Galilee to the north, Judea to the south, and Samaria in the middle. See each of these articles. Judea Proper extended from the Dead Sea and the Mediterranean to Egypt, and included the countries of Benjamin, Dan, and Simeon, beside that of Judah. Under the Romans the land began to be divided into tetrarchies and toparchies: the larger were those of Judea, Samaria, and Galilee, upper and lower; the lesser, those of Geraritica, Sarona,
Saron, and others of less note; all which lay on this side of the Jordan. The rest, on the other side, were those of Gilead, Peraz, Gileonitis, Auranitis, Batanata, and Decapolis. Josephus (Antiq. i. xiv. c. 12.) mentions another division, made in the time of Gabinus, into five districts, or, as he styles them, *περιπυρος, or councils, agreeably to the Roman manner; these were Jerusalem, Jericho, and Scythopolis, on this side of Jordan; and Gadara and Amathus on the other. The whole country was also called *Palestine* (which see), from the Philistines or Philinities, who inhabited the western coasts, and were first known to the Romans; but it was more commonly called *Judaea* (which see), or Judea Palestina, from Judah, whose tribe was the most considerable of the twelve, and possessed the finest and most fertile part of the whole. Christians, as well as Jews, have dignified it with the title of "Holy Land," partly on account of its metropolis, supposed to have been the centre of God's worship, and his peculiar habitation; but chiefly for its being the native country of Jesus Christ, and the scene on which he accomplished the great work of our redemption. It has also been distinguished by other apppellations: such as the "Land of Promise," or the "Land of God," or the "Land of Israel," and sometimes, by way of preeminence, the "Land." In modern writers, all distinction is frequently lost in the general name of *Syncr, which is given to the whole country east of the Mediterranean, between the sea and the desert. As many of the old inhabitants of the north-west of the land of Canaan, particularly on the coasts of Tyre and Sidon, were not driven out by the children of Israel, this tract seems to have retained the name of Canaan a long while after these other parts of the country, which were better inhabited by the Israelites, had lost the said name. The Greeks called this tract inhabited by the old Canaanites, along the Mediterranean sea, *Perea* (which see); the nearer inland parts, as being inhabited partly by Canaanites, and partly by Syrians, Syro-Phenicis; and hence the woman said by St. Matthew (ch. xv. 22.) to be a woman of Canaan, whole daughter Jesus cured, is said by St. Mark (ch. vii. 25.) to be a Syro-Phenician by nation, as she was a Greek by nation and language. The principal mountains of the land of Canaan or Palestine are Libanus or Lebanon, Anti-Libanus, Hermon, Tabor, Carmel, Olive, Colvary, Moriah, and Gilboa, which see respectively. The most noted valleys are the valley of Beiting, or Be'erkah, in the tribe of Judah, on the west side of the lake of Sodom, and in the wildernees of Tekoah; the vale of Siddim, famed for the overthrow of the Chedorhemmon and his confederate kings (Gen. xiv. 2, &c.); and for the cities of Sodom and Gomorrah, now making the Asphaltite lake; the valley of Shaveh, or royal valley, where the king of Sodom met victorious Abraham, after the defeat of the confederate kings; the vale of Salt, in which the Edomites were subdued by David and Amaziah (2 Sam. viii. 13. 2 Kings, xiv. 7); the valley of Jeruel, famed for the death of Jezebel, the idolatrous wife of Ahab; the valley of Maure, famous for the oak under which Abraham dwelt, about 15 miles from Hebron, and 25 from Jerusafem; the vale of Rechaim, or of the Titans and Giants, near the city of Jerusafem, the vale of Jeohophat, in or near Jerusafem; the valley of Hinnom, near the walls of Jerusafem, notorious for the burnt offerings and bloody rites performed in it by the saddest ages; the valley of Zebaim, near the Dead Sea; the valley of Achor, near Jericho; the valley of Bochina, or of the mourners (Judg. ii. 15, &c.), at a small distance from Jerusalem; and the valley of Elah, famous for the defeat and death of Goliath by David, and for the victory which the Israelites obtained against the Philistines (1 Sam. xvii. 2. &c.). The country had also several noted plains, the most remarkable of which is that through the midst of which lay the course of the river Jordan, computed to be about 150 miles in length, from the city of Sicythopolis northward to the Asphaltite lake. In this country were also several forests, such as those of Haroth, of Ephraim, of Lebanon, in which Solomon had a magnificent palace, and of Bethel. The seas of Canaan are commonly reckoned five, viz. the Mediterranean, called by the faced writers the Great Sea; the Dead Sea; or Lake of Sodom; the Sea of Tiberias; the Samacdonite Sea or lake; and the Sea of Jazer. The most considerable river is Jordan, which see. For a further account of this country and its inhabitants, see CANAANITES and PALESTINE.

CANAAN, in Geography, a thriving township of America, in Lincoln county, and district of Maine, seated on Kennebeck river, about seven miles north of Hancock, incorporated in 1788, and containing 254 inhabitants.—Alfo, a township of Grafton county, in New Hampshire, 10 miles E. of Dartmouth college; incorporated in 1751, and containing 1,750, 453 inhabitants.—Alfo, a township of Lenox county, in Connecticut, E. of Hoatstonick river, with Massachusetts on the north. It has a forge and furnac, and tradesmen excellent men. The mountains abound valuable minerals, particularly lead and iron. It is distant 60 miles from New Haven, and 33 N.W. from Hartford.—Alfo, a township of Middlesex county, in Vermont, being the north-easternmost town in the state.—Alfo, a township of Columbia county, in New York, between Kinderhook and the west, and Maschuchett on the east. It has 6,652 inhabitants, including 35 free.

CANAANITES, in Scripture History, the pofterity of Canaan by his eleven sons, who are supposed to have settled in the land of Canaan, for about the division of Jacob. Five of these are known to have dwelt in the land of Canaan; viz. Hezib, Hebus, Hemor, or Amor, Girgash, and Hemi or Hiv; and their, together with their father Canaan, became the heads of so many nations. Sina or Sini was another son of Canaan. whose settlement is not so precisely ascertained; but some authors infer, from the affinity of the names, that the descenf of Sin and much Sinah, were the place of his abode, and that they were so called from him. The Hittites inhabited the country about Hebron, as far as Beer-sheba, and the brooks border, reckoned by Moses the southern limits of Canaan. The Jehuites dwelt near them on the north, as far as the city of Jubes, once called Jerusafem. The Amorites possessed the country on the east side of Jordan, between the river Amon on the south-east, and mount Gilead on the north, afterwards the lot of Reuben and Gad. The Girgashites lay next above the Amorites, on the east side of the sea of Tiberias, and their land was afterwards posseed by the half tribe of Ma-nafeth. The Hivites dwelt northward, under mount Libanus. The Perizzites, who make one of the seven nations of the Canaanites, are supposed, by Heylin and others, to be the descendants of Sina or Sini; and it is probable, since we do not read of their abode in cities, that they lived dispersed, and in tents, like the Scythians, roving on both sides of the Jordan, on the hills and plains; and that they were called by that name from the Hebrew, *pharajjas*, which signifies to *dispers*e. The Canaanites dwelt in the midst of all nations, and were surrounded by the roll. This appears from the sacred writings to have been the respective situation of those seven nations, which are said to have been doomed to destruction for their idolatries and wickedness, when the Israelites first invaded their country. The learned have not absolutely determined whether the nations proceeding from Canaan's
Canaan’s other six sons should be reckoned among the inhabitants of the land of Canaan. The prevalent opinion is, that they were not included. As to the customs, manners, arts, sciences, and language of the seven nations, that inhabited the land of Canaan, they must, from the situation they severally occupied, have been very different. Those who inhabited the sea-coast were merchants, and by reason of their commerce and wealth scattered colonies over almost all the islands and maritime provinces of the Mediterranean. See Ptolemais. The colonies which Canaan carried to Thbes in Bocotia, and his brother Caleb into Cilicia, are said to have proceeded from the Rock of Canaan. Sicily, Sardinia, Malta, Cyprus, Corfu, Majorca, Minorca, Gades, and Ebbitis, are supposed to have been peopled by the Canaanites. (See Bochart’s Canaan.) The other Canaanites, whose situation was inland, were employed partly in husbandry, partly in tillage, and they were also well skilled in the exercise of arms. Those who dwelt in the walled cities, and who had fixed abodes, cultivated the land; and those who wandered about, as the Perizzites seem to have done, grazed cattle, or carried arms: so that among the Canaanites we discover the various classes of mercenary soldiers, and, consequently, marines of artificers, soldiers, shepherds, and husbandmen. We learn, also, from their history, that they were all ready, however diversified by their occupations or local interests, to join in the common cause: that they were well appointed for war, both offensive and defensive; that their towns were well fortified; that they were sufficiently furnished with military weapons and warlike chariots; that they were daring, obdurate, and almost invincible; and that they were not delinquent of craft and policy. Their language, we find, was well understood by Abraham, who was an Hebrew, for he conversed readily with them on all occasions; but as to their mode of writing, whether it was originally their own, or borrowed from the Israelites, it is not easy to determine. Their religious feems to have been preserved pure till the days of Abraham, who acknowledged Melchisedek to be priest of the most high God; and Melchisedek was, without doubt, a Canaanite, or, at least, dwelt at that time in Canaan, in high esteem and veneration.

But we learn from the scripture history, that the Hittites in particular were become degenerate in the time of Isaac and Rebekah; for they could not endure the thoughts of Jacob’s marrying one of the daughters of Heth, as Elise had done. About this time, then, we may date the origin of those abominations which desolated them to the divine displeasure, and made them unworthy of the land which they possessed. In the days of Moses, they were become incorrigible idolaters; for he commands the Israelites “to destroy their altars, and break down their images ( financially and pillars), and cut down their groves, and burn their graven images with fire.” And left they should pervert the Israelites, the latter were strictly enjoined not to intermarry with them; but “to hate them, and utterly destroy them, nor shew mercy upon them.” Deut. vii. 1—5. They are accused of the cruel custom of sacrificing men, and are said to have passed their heed through fire to Moloch. Levit. xviii. 21. Their morals were as corrupt as their doctrine; adultery, belliosity of all sorts, fornication, incest, and all manner of uncleanness, are the sins laid to their charge. The Canaanites, says Mr. Bryant, (Anc. Anc. Mythol. vol. i. p. 371.) as they were a filter tribe of the Mizraim, resembled them in their rites and religion. They held a heifer, or cow, in high veneration, agreeably to the customs of Egypt. Their chief deity was the sun, whom they worshipped, together with the Baalim, under the titles of Ourchol, Adonis, or Thammuz. The Canaanites, at Byblos, Erytus, Sidon, and afterwards at Tyre, used, in imitation of the Egyptians, mournful daces for the loss of Adonis or Thammuz, who was the same as Thamus and Osiris in Egypt; and their measures and harmony seem to have been very affecting, and to have made a wonderful impression on the minds of their audience. This infection made of worship prevailed to such a degree, that the children of Israel were forbidden to weep, and make lamentation upon a festival. See Nehem. viii. 9. 11. Joseph. Antiq. i. xi. c. 5. p. 563. Among the Canaanites, this manifestation of sorrow was encouraged, and made part of their rites.

As to the government of the Canaanites, they seem to have been comprehended in a great number of states, under subjection to limited chiefs, or kings, as they are called; and transacted all their business in popular assemblies.

When the measure of the idolatries and abominations of the Canaanites was completed, God delivered their country into the hands of the Israelites, who conquered it under Joshua. However, they refilled with obdurate valor, and kept Joshua employed six years, from the time of his passing the river Jordan, and entering Canaan, in the year B. c. 1451, to the year B. c. 1445, the fabbatical year beginning from the autumnal equinox; when he made a division of the land among the tribes of Israel, and refted from his conquests. As God had commanded his people, long before, to be treated with rigour (See Deut. vii. 2.), Joshua extirpated great numbers, and obliged the rest to fly, come into Africa, and others into Greece. Procopius says, they first retreated into Egypt, but advanced into Africa, where they built many cities, and spread themselves over those vast regions, which reach to the Straits, preferring their old language, with little alteration. In the time of Athanarius, the Africans still said they were descended from the Canaanites; and when asked their origin, they answered, “Canaan.” It is agreed, that the Punic tongue was nearly the same as the Canaanitific or Hebrew.

After the Canaanites had been successively defeated, and, at length, dispersed and reduced, the Anakims, a fierce and barbarous race, who inhabited some of the mountains of the land, of a distinct origin from the Canaanites, were invaded and cut off; and thus, by degrees, the Israelites became masters of the greatest part of the land of Canaan. However, the Canaanites of several denominations were strong and powerful, and retained no mean share of the country; and, for 10 or 20 years, the remainder of Joshua’s days, they were very little molested. At length, when the division was completely settled, the Canaanites were, on all sides, invaded again by the tribes of Israel, who wished to drive them out of their respective lots. However, in the conflicts thus occasioned, the contending parties seem to have been pretty equally matched; so that although multitudes of the Canaanites were slain in the wars with Joshua, and many of them fled in quest of more quiet habitations, yet, after all their calamities, they appear to have been little inferior to the Israelites; nor do we find that any one tribe of them was missing, except the Girgasithes, who, it is said, fled into Africa, and settled in that country. Thus it appears, that some of the more immediately devoted nations, viz. the Canaanites, Hittites, Amorites, Hivites, and Jebuites, were allowed to dwell in common with the children of Israel in their promised land. See Judges, ch. i. ii. For this exercise of mercy and toleration reasons of a political and religious nature have been assigned. Thus the Israelites were prevented from sinking into a flagitious and incautious state, as they had enemies to excite and exercise their courage, and...
CANAANITES.

to keep up among them martial discipline; they were thus preferred in a condition of immediate dependence on God, and directed to look constantly to him for succour; and it was thus provided, that no part of the country, which was too extensive to be every where inhabited by the Israelites at their first settlement, should be left desolate, so as to become a refuge for wild beasts, which, by their increase, might prove a more dreadful and pernicious enemy than the Canaanites. Besides, it has been very justly alleged, that though the order for extermination was positive and absolute, the promise of power to fulfill it was limited and conditional. It was not till after the Israelites had forsaken the Lord, and worshipped other gods, that the Lord would no more enable them to expel the Canaanites. The Canaanites seem to have been able to have maintained their ground in several parts of the country; and particularly in Jerusalem, till the reign of David; when that city, which had been held by the Jebusites, was taken by force. They were also invaded in Gezer by Pharaoh; their city was burnt, and they were all put to the sword. Thus oppressed by the Israelites on one hand, and by the mighty power of Egypt on the other, the remaining Amorites, Hittites, Perizzites, Hivites, and Jebusites, were reduced, in the reign of Solomon, to a state of slavery, and employed in the labour of carrying on his vast and sumptuous works; and this severity was entailed on their posterity. 1 Kings, ix. 20, 21. Ezra, ii. 55, 58. Nehem. xi. 3. Although upon their first reduction, they became prostrate to the Jewish religion, yet it has been thought, that they were distinguished from the Jews, and reckoned of a more ignoble blood, born to drudgery. Among the tribes of the Canaanites above enumerated, who became subject to the yoke of Solomon, the Canaanites, peculiarly so called, are omitted. These, we may therefore conclude, bore no part of the burden imposed upon the others; but remained free and independent in their possessions on the sea-coast, rose afterwards to great celebrity, and, continually improving themselves in navigation, commerce, and the useful arts, were comprised under the appellation of Phoenicians. Anc. Un. Hist. vol. i.

The destruction of the Canaanites, and the expulsion of them from their country by a divided order, whilst some of them were allowed to remain in opposition to this order, have afforded a theme, on which sceptics and infidels have vehemently declaimed; and which they have urged as an unanswerable objection either to the truth of the scripture history, or, admitting the fact, to the moral providence of God. This objection has been lately flated in its full force by a learned commentator and critic (Dr. Geddes) in the preface to the 2d volume of his "Translation," and also in the 18 volume of his "Critical Remarks," p. 423, &c.; and instead of obviating it by argument, or admitting the sufficiency of the solution of the difficulty, proposed by other ingenious and learned writers, he boldly cuts the Gordian knot, refuting the order supposed to be given by God for the extermination of the Canaanites; deeming this method preferable to the unsuccessful endeavours of other scriptural writers to unite it. Instead of according to any of the arguments which have been employed in defence, or even in extenuation, of this supposed cruel and fanitical measure, he denies that any such order proceeded from God, or even from the mouth of Moses. He suspites it to be "the fabrication of some posterior Jew, to justify the cruelties of his nation." Of course, he supposes this fabulous and universal inspiration of the Hebrew writers. It is beside our purpose to enter at large into the discussion of this subject. But when we consider, that the extermination of the Canaanites forms a leading and prominent part of the scripture history, and that it is, more directly or indirectly, referred to as the consequence of a divine order, in a great variety of passages, the idea of the fabrication of such an order by a posterior Jew, seems to us to be altogether imdissipable. The account of this event, and of the circumstances succeeding and attending it, pervades the whole Jewish history; and if we suppose that the providence of God had no concern in the conduct and execution of it, we must be led to admit a great number of fabrications and interpolations in the detailed account which the scripture has given us of it, and we shall ultimately undermine the truth of the history itself, and find it difficult to determine what part of it is authentic and true and what is forged and false. But we are of opinion, that the objection itself, which has been repeated by Tindal, Morgan, and Bolingbroke, and last of all by the author of the "Age of Reason," has been as often satisfactorily refuted. To this purpose it has been argued, that the Canaanites were guilty not only of the grossest idolatries, but of the most execrable vices, some of which have been thought to deserve death, and have been so punished in all civilized countries. God expressly declares, after warning the Israelites against these abominable crimes, that because of these things "he abhorred those nations and cast them out." Lev. xx. 23. It is plain, then, that the wick- edness of the Canaanites was the true cause of the punish- ment that was inflicted upon them; and accordingly it is given as a reason why they were not long before expelled and destroyed, that the "iniquities of the Amorites was not yet full." Gen. xv. 16. It was not, therefore, till the measure of their sins was completed, and their wickednesses became universal and incorrigible, that the threatened judgment was inflicted. Now it can be denied, that God, who is the sovereign arbiter of life, and who, may, and actually does, whenever he pleases, take away men's lives without injustice, may in such judgment cut short the lives of persons for their crimes, and bring general destruction even upon communities of people or nations? Why, it may be asked, should the destruction of a small part of the inhabi- tants of the earth be pronounced to be incompatible with the divine attributes, while the destruction of the whole world by the deluge is passed by without any comment? The general destruction of the human race in the latter case, and the partial extermination of the Canaan- ites, are to be accounted for upon precisely the same principle. In both cases it was the enormous wicked- ness of the people which drew upon them such signal punishment. This kind of punishment of individual or na- tional wick- edness may serve the purpose of instructive example and warning to the world in general; and in the case before us it was highly expedient, and even necessary for the instruction of that age of mankind, that the Supreme Ruler should make a signal and striking example of a nation so far sunk in idolatry and corruptions of all kinds, as all the inhabitants of Canaan are said to have been. With re- spect to the mode of the punishment of the Canaanites, it may be observed, that if God had destroyed them by famine or by pestilence, if he had caused fire from heaven to con- sume them, or exterminated them by an inundation or an earthquake, none could have preferred to arrogate the wisdom and justice of his proceedings; although in ex- emplifications of this public nature infants must have suffered with adults; and since the righteous individuals must have been involved in the common ruin. In such a case it could not have been said,
that this was contrary to the law of nature, or that it was not conformable to the usual conduct of Providence. But then it would not have been so apparent, that this calamity of their extermination was inflicted by way of punishment for their idolatry and detestable wickedness. It might possibly have been attributed to some natural cause, or have been regarded as an unaccountable and fortuitous event. But when they were ordered to be exterminated for their abominable crimes by an express command of God, attended by a series of the most amazing miracles and divine interpositions; and this was appointed to be executed by another nation, peculiarly set apart by their own constitution to the acknowledgment and worship of the one true God, and of him only, and to whom God had given the most excellent and holy laws, threatening them at the same time with similar punishments if they committed the like crimes,—in this case, the reason of the judgment was as apparent as when a malefactor is put to death by an officer of justice for a crime, in execution of the sentence of a just magistrate. Nor in such a procedure is there any thing, that can be proved to be inconsistent with the wisdom and righteous acts of the Supreme Being, or contradictory to his own laws; since there is no law of nature that dehors God from executing judgments on particular persons, or guilty nations, for their crimes and vices, even to extermination; or from employing, if he thinks fit, one or more nations to execute his judgments upon others. In this instance the word of God is in perfect harmony with his works and those manifestations of the divine attributes that are discernible in the book of nature.

Although God cannot dispense with the absolute and immutable obligations of doing whatever is just and right; yet a command from God may either make or imply some change in the circumstances and relations of things, on which the moral fitness of the human conduct depends, and consequently it may be fit and right to do that in virtue of a divine command, which it would not have been fit to do without it.

Lord Bolingbroke, indeed, (vol. iii. p. 206. vol. v. p. 148.) has compared the invasion of Canaan by the Israelites, and what they did there, to the cruelties exercised by the Spaniards in America, and to the ravages of the Huns under Attila, who, he says, were much more merciful than they; but he seems to forget the difference between these cases: viz. that the latter had no motive or pretence, but their own ambition, avarice, and cruelty; whereas the former acted in execution of the express command of God, and by a commission from him, the truth of which was confirmed by a series of the most extraordinary divine attestations that the world ever saw. This can, therefore, furnish no precedent for any other nation to do the like, except they can produce the same or equal proofs of a divine commission. The same general answer will suffice for obviating several of the inferences deduced from this event by Dr. Geddes, ubi supra. It would be a sufficient reason for the extermination of the Canaanites by the sword of the children of Israel, if, as is very possible, this was the best method of impressing the minds of the Israelites themselves with a just idea of the heinous nature of idolatry, and to make sufficient provision against their being induced into the same abominable practices. If their living only in the neighbourhood of idolatrous nations was so unsafe for this people, as their history shows it to have been, what danger would they not have been in, if they had spared the old inhabitants of Canaan, and suffered them to live unmolested among them? It ought also to be considered, that in all the other wars in which the Israelites might happen to be engaged, with their neighbouring nations, they were expressly enjoined to pursue different and more humane maxims, sparing all except such as were found bearing arms. In this particular case only they were expressly commanded to "exterminate utterly." That the Israelites were not influenced by the usual passions of conquerors, but acted under an authority which controlled their natural desires, is manifest from their sparing even the cattle, and even refraining to appropriate to themselves the treasures which they found in Jericho, which was the first fruits of their conquests, and to be devoted to God. The Israelites have often been compared to barbarous conquerors and cruel murderers; but let other conquerors and spoilers be produced, who refrained from plunder as they did. That they were not actuated by mere rage and revenge is evident from their having received no particular provocation, not indeed having had any personal intercourse with the inhabitants of Canaan. Their motives must, therefore, have been very different from those of common robbers and murderers; and in the judgment of reason, it is the motive that determines the nature of the action. It is also remarkable, that notwithstanding the passion which the Israelites may be supposed to have had for war, which would have been inflamed by the rapidity of their conquests, they were forbidden to extend them beyond the boundaries of the land of Canaan; and the constitution of their government was altogether unfitted to extensive empire.

The learned Mr. Bryant in his Treatise on the authenticity of the Scriptures, (p. 245. &c.) argues against the objections which we have been considering, that the Canaanites were usurpers, and had acted in direct defiance of an ordinance of God, by seizing upon the land appropriated from the beginning to the children of Israel. Moreover, according to the learned author, the land of Canaan was their peculiar inheritance, Deut. xxxii. 7, 8. In the Eusebian Chronicle of Scaliger it is mentioned, that Canaan the son of Ham, first made an innovation in the world. "He transgressed upon the rights of his brethren, and seized upon the land, which had been appropriated to God's future people." When the Israelites, therefore, were brought to Canaan, they came to their own inheritance, and those who usurped their property knew it, and knew by whom it had been appointed.

After all, we may observe, that the order to exterminate utterly in the case of the Canaanites, though expressed in absolute terms, is supposed by some to have been conditional in fact; and that their lives were to have been spared upon their submission, and especially upon their forsaking idolatry. Accordingly, it is plain in fact, that the Israelites either did not understand the command to be absolute, or they knowingly transgressed it, even in the most and most flourishing part of their affairs. To this purpose we have already remarked, that many of the Canaanites lived in subjection to the Israelites even to the times of their kings (1 Kings ix. 20, 21.) nor do we ever read that they were blamed for the favour they showed them. Moreover, the reason and end for which the order for the extermination of the Canaanites was given, viz. left the children of Israel should be checked by them into idolatry, entirely cut off from their submision, and abandoning their idol worship, which was generally the case. Besides, it is pretty clearly inferred, that this order was conditional, from the circumstances, that if the hearts of the Canaanites had not been hardened to oppose the Israelites, they would not have been cut off. Josh. xi. 20, 25. Accordingly it has been alleged, that the severity of the judgments inflicted upon the Canaanites for their extreme wickedness, of which the Israelites were the instruments, was not executed in the degree of
to the extent which has been supposed. This has been maintained with great strength of argument by learned and impartial judges; by Maimonides and others of the full account among the Jews, and also by many Chriftians of our own and other countries. Grubbis, in particular, on Deut. xx. 10. maintains, that the law, Exod. xxxii. 31, 32. and Deut. vii. 2, was to be extended only to future people as did not surrender themselves on being summoned: as is evident from Joshua xi. 19, 20. We shall further add, that idolatry, under the Jewish theocracy, was a crime of peculiar malignity; and therefore, although God has not thought fit to enact a general law obligatory on all mankind for punishing idolaters with death, and without his appointment it might not be executed; yet when it pleased him for wise ends to select a particular nation, and among them to erect a peculiar sacred polity, and to appoint that the worship of the one true God and of him only should be the very basis of their constitution, on which all their privileges, their national property, and their right to their country depended, it is evident, that under such a constitution to revolt to idolatry and polytheism was in the most criminal sense to be traitors to the community: and of course to arraign a law for inflicting a capital punishment upon idolaters under that particular constitution is highly absurd. Nor should it be forgotten, that the idolatry of the ancient Gentile world, and especially that of the inhabitants of Canaan, was by no means a fyllem of merely speculative opinions; but a course of the most atrocious and abominable practices, enjoying the cruel murder of numberles innocent children, as well as other human victims, and the most shocking lownefs, together with other vices of the most detestable nature. And surely it becomes a wise legislator and the moral Sovereign of the universe to restrain, by the most authoritative and awful sanctions annexed to his laws, the commission of such destructive vices as these.

Mr. Wakefield, in his "Reply to the Second Part of the Age of Reason," by Thomas Paine, suggests, that some qualifications and softening in the cafe of many relations and occurrences in the scripture history, may be properly admitted, without any danger to the main fabric of revelation, upon the ground of exaggeration from national vanity, and the pride of individuals. Hence, he says, we may presume upon enlargement in the part of the narrative on the splendour of their victories, the number of the slain, and the extent of their defolations. He further intimates, that the Jewish historians had been accustomed to speak of every tranflation as preferred by the exprefs injunctions of Jehovah, when we are under no necessity, as he conceives, of supposing a specific and actual interference in the cafe, but may very rationally, and in conformity to the rules of accepted interpretation, have recourse for a solution to that predominant and universal persuasion, from their infancy, of the peculiar superintendence of Jehovah, not only over the political welfare of their state, but the private concerns of individuals. He adds, that it is a point worthy of investigation how far Joshua, and his fellow fuditors, in conformity to the ferocious character of the times, and the fanguinary propensities of military men, may actually have exceeded their commission, and indulged themselves in unauthorized acts of murder, rapine, and devastation. Having collected a variety of opinions on this interefting subjeft, we must refer for a further discussion of it to the authors already cited, and to the following publications: Leland's Anfwer to Chriftianity as old as the Creation, vol. ii. p. 429, &c. Leland's Deific Writers, vol. ii. p. 446, &c. Prieftley's Institutes, vol. ii. p. 22, and Prieftley's Notes on all the Books of Scripture, vol. i. Preface, Sermons, &c. by Joseph Nicol Scot. vol. i. Lindley's Conversations on the Divine Government, p. 80—83. Bifhop of Lincoln's Elements of Chriftian Theology, vol. i. p. 70, &c.

**CANADA.**

In the year 1759 Quebec was captured by General Wolfe; and Canada was ceded to Great Britain by the treaty of Paris in 1763. From this period till the year 1774 the internal affairs of the province were regulated by the ordinance of the governor alone. In pursuance of the Quebec bill, which was then passed, a legislative council was appointed by his majesty, and the number of its members was limited to twenty-three. But by an act passed by the British parliament in 1791, the executive power in each province was vested in the governor; and a legislative council, and an assembly, were appointed for each of the provinces of Upper and Lower Canada, having power to make laws with the consent of the governor; but the king may declare his dissent at any time within two years after the bills are received, in which case they become void. The legislative council of Lower Canada consists of 15 members; that of Upper Canada of seven. They are summoned by the governor under the king's authority, and appointed for life, unless they forfeit their office by an absence of four years.
years, or by swearing allegiance to any foreign power. The assembly of Lower Canada consists of 50 members, and that of Upper Canada of 16; and they are chosen by the freetholders in the towns and districts. The assembly is not to continue longer than four years, but it may be dissolved sooner; and the governor is bound to convene it at least once in each year. The governor, together with such of the executive council, as shall be appointed by the king for the affairs of each province, are to be a court of civil jurisdiction for hearing and determining appeals; subject, however, to such appeals from their sentence as heretofore existed. All lands in Upper Canada are to be granted hereafter in free and common fociage; and also in Lower Canada, when the grantee shall define it, subject, nevertheless, to alterations by an act of the legislature; and the present system of judgement in each province was established by the Quebec bill of 1774. But whilst the French laws were suffered by the Quebec bill to be stricken, in order to conciliate the affections of the French inhabitants, who were attached to them, although the abolition of these laws would be favourable to the interests of civil liberty; the criminal law of England was happily elaboured through every part of the country. The whole of British America, Canada included, is superintended by an officer styled governor-general of the four British provinces in North America, who, besides other powers which he possesses, is commander in chief of all the British troops in the four provinces, and the governments attached to them, and Newfoundland. Each of the provinces has a lieutenant-governor, who, in the absence of the governor-general, is invested with all the powers requisite to a chief magistrate.

By an act passed in the 18th year of his present majesty's reign, the British parliament has the power of making any regulations, that may be found expedient, respecting the commerce and navigation of the province, and also of importing, export duties, retributed to the use of the province, and applied in such a manner as the laws made in the council and assembly direct.

Every form of religion is completely tolerated in both provinces; but the Roman catholic religion is that of a great majority of the inhabitants; and by the Quebec bill of 1774, ecclesiastics of that persuasion are legally empowered to recover all the dues, which, before that period, they were accustomed to receive, as well as tithes, from the Roman catholic inhabitants; nevertheless, they cannot exact any dues or tithes from Protetants, or from lands held by Protetants; although such lands might formerly have been subjected to dues and tithes for the support of the Roman catholic church. These dues and tithes are, however, still to be paid to persons appointed by the governor and reserv'd in the hands of his majesty's receiver-general, for the support of the Protetant clergy actually residing in the province. By the act of the year 1791, it was also ordained, that the governor should allot out of all lands belonging to the crown, granted after that period, one-fourth of the benefit of the Protetant clergy, to be solely applicable to their use; and it is required that all such allotments should be particularly specified in every grant of wattle-lands; otherwise the grant is void. The governor, with the advice of the executive council, is authorized to constitute parishes or rectories, and to endow them out of these appropriations, and to present incumbents to them, ordained according to the rites of the church of England. The clergy of this church, in both provinces, consist at present only of 12 persons, including the bishop of Quebec; whereas those of the church of Rome amount to 130, viz., a bishop, three vicars-general, and 116 curates and missionaries, all of whom are resident in the lower province, except five curates and missionaries. The number of the dissenting clergy, in both provinces, is considerably smaller than that of the clergy of the church of England.

The population of Upper Canada has been lately stated to amount to 40,000, by others to 20,000 British and French inhabitants, exclusive of 10,000 loyalists, who are settled in the upper parts of the province. Lower Canada, according to a census, ordered to be taken by general Haldimand in 1784, contained 11,928 inhabitants. Both provinces may probably now contain more than 50,000 persons; and their number is multiplying both by a natural increase and by emigrants from other countries. The number of savages has been estimated at 50,000. About nine-tenths of the inhabitants of these provinces are Roman catholics; and about five-sixths of those of Lower Canada are supposed to be of French extraction. Some of the lower classes of the French Canadians possess all the gaiety and vivacity of the people of France; but others have, to appearance, a great deal of that lowness and bluntness in their manners which is characteristic of the people of the United States. vanity, however, is the predominant feature in the character of all of them. Few of the men can read or write, and in this respect are more inferior to the women; but both men and women are fond in ignorance and superstitious, and blindly devoted to their priests. The French language is universally used; English being restricted to the few British settlers. The houses in Lower Canada are in general well furnished with beds, in the French style, very large, and raised four or five feet high. The houses are for the most part built of logs; but they are much more compact and better constructed than those of the United States; the logs being fitted more closely together, planed and white-washed externally, and generally lined with deal boards within. However, the inattention of the inhabitants to the admittance of air, by occasionally opening their windows, renders them very disagreeable and even unhealthy. The expences of the civil lift in this province are estimated at 20,000l. per annum, one-half of which is defrayed by Great Britain, and the other moiety by the province, out of the duties paid on the importation of certain articles, such as spirits, wine, sugar, molasses, coffee, tobacco, salt, and spirts of various kinds. The expences of the civil lift in Upper Canada is estimated at about a fourth of that of the lower province. The military establishment in both provinces, together with the repairs of fortifications, &c., is computed to cost Great Britain 100,000l. annually; and the like sum is chargeable for presents to the Indians, and salaries to officers employed among them in trade, &c., in Upper Canada. These expences, however, are thought to be counterbalanced by the advantages of the commerce with this country, which is paid to employ about 7000 tons of shipping annually. The imports into Canada consist of earthen-ware, hard-ware, and household furniture, various articles of woollen, linen, and cotton, haberdashery, holiey, &c. stationery, leather, and its manufactures, gro-cery, wines, spirits, West Indian produce, &c. &c. cordage of every description, and the coarse manufactures of iron. Some domestic manufactures of linen and of coarse woollen cloths are carried on in molt parts of Canada; but the greater part of these articles is supllyed by Great Brit-ain. The exports from Canada consist of wheat, flour, biscuit, timber, flaxes, and lumber of various kinds, dried fish, oil, ginifeng, and various medicinal drugs, but principally of furs and peltries. The eastern part of Lower Canada, between Quebec and the gulf of St. Lawrence, is mountainous; and a few scattered mountains also occur between Quebec and the mouth of the river Utawas; but higher up the river St. Lawrence the face of the country is flat. The soil consists principally of a loofe dark-coloured earth.
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carr, 10 or 12 inches deep, lying on a bed of cold clay. This thin mould, however, is very fertile, and yields plentiful crops, although it is worked every year by the French Canadians, without being ever manured. The manure chiefly used, since the practice of manuring has been introduced, by those who are the best farmers, is marl, which is found in great quantities in many places along the shores of the river St. Lawrence. The soil of Lower Canada is peculiarly adapted to the growth of small grain. Tobacco also thrives well in it, but the culture is neglected, except for private use; and more than half of what is used is imported. The snuff produced from the Canadian tobacco is held in great estimation. Culinary vegetables arrive at great perfection in Canada, which is also the case with most of the European fruits. The currents, gooseberries, and raspberries are very fine; the latter are indigenous, and are found very abundantly in the woods. A kind of vine is also indigenous; but the grapes produced by it in its uncultivated state are very poor and few, and not much larger than fine currants. In the forest there is a great variety of trees; such as beech, oak, elm, ash, pine, lycamore, chestnut, and walnut; and the sugar maple-tree is found in almost every part of the country. Of this tree there are two kinds; the one called the swamp maple, being generally found on low lands, and the other, the mountain or curled maple, from its growing upon high dry ground, and from the grain of its wood being beautifully variegated with little stripes and curls. The former yields more sap than the latter, but its sap affords less sugar. A pound of sugar is frequently procured from two or three gallons of the sap of the curled maple, whereas no more than the same quantity can be had from six or seven gallons of that of the swamp tree. The maple sugar is the only sort of raw sugar used in the country parts of Canada, and it is also very generally used in the towns. See Sugar.

The air of Lower Canada is very pure, and the climate uncommonly salubrious, except in the western parts of the province, high up the river St. Lawrence. From Montreal downwards the climate is very much resembles that of the states of New England. This difference of salubrity in the two parts of the province is ascribed by Mr. Weld to the different aspects of the country; to the east, Lower Canada, like New England, is mountainous, but to the west it is an extended flat. According to his account, the extremes of heat and cold are amazing; Fahrenheit's thermometer, in the months of July and August, rising to 96°, and yet in winter the mercury generally freezes. The transitions from heat to cold are less sudden, and of course less injurious to the constitution in Canada than in the United States; and the seacons are much more regular. The snow begins to fall in November; which is the most unpleasant, cold, and gloomy part of the year: but in December the clouds are generally diffused, the frost sets in, and the sky assumes a bright hue, continuing for weeks without a single cloud. The greatest degree of cold occurs in January, and it is sometimes so intense, as to endanger a person, who is exposed to it, being frost-bitten; but the coldest days have intervals of warm weather. The winter in Canada is the season of general amelioration; and the Canadians transport themselves over the snow by means of their cariolas and sledges, each of which holds two persons and a driver, and is usually drawn by one horse, with woolen clothed bases, as well as great pleasure. With the same horse, says Mr. Weld, it is possible to travel 80 miles in a day. The Canadians contrive to guard against the cold by several robes placed in their huts, from which flues pass to their different apartments, and by double windows and double doors to their houses. When they go abroad, they cover the whole body with furs, except the eyes and nose. In May the thaw comes on very suddenly, and in its progress, the ice in the river St. Lawrence breaks with the noise of a cannon, and pades towards the sea with a tremendous rapidity and violence. As soon as the winter terminates, the rapid progress of vegetation is astonishing. Spring has scarcely appeared before it is succeeded by summer. In a few days the fields are clothed with the richest verdure, and the trees regain their foliage. The grain is found in grain time in May affords a rich harvest by the latter end of July. At this season of the year, however, Fahrenheit's thermometer seldom rises above 84°; in July and August it sometimes rises to 96°. The fall of the year is a most agreeable season in Canada, as well as the summer. It is observed, that there is in general a difference of about three weeks in the length of the winter at Montreal and at Quebec; and of course in the other seasons. When green peas, strawberries, &c. were entirely grown at Montreal, they were in full season at Quebec.

Mr. Weld, to whom we are indebted for a great part of this article, (see his Travels, vol. i.) has pointed out some inconveniences attending the tenures of land in Canada, which ought to be removed; more especially as in such a climate there is no occasion for a barrier against colonization. The botany of Canada differs little from that of the United States; and the chief singularities in the zoology are the moose, the beaver, and some other animals described by Mr. Pennant in his Arctic zoology. The reindeer appears in the northern parts, and the puma and lynx are not unknown. Both the Canadas are much infected with rattle-snakes. The humming bird is not uncommon at Quebec. The mineralogy is of little importance; and though iron ores have been discovered in various parts of the country, works for the smelting and manufacturing of it have been erected only at one place, in the neighbourhood of Trois Rivières. The works are now the property of the British government. The bank of ore that supplies them is nearly exhausted. We learn from Kalm (vol. ii. 349.) that there are lead mines which yield some silver; and it is probable that copper may be found, as it appears in the south-west of Lake Superior. Coal has not yet been discovered in Canada. The country soil remains to be examined, and it is highly probable that important discoveries might be made. Its chief natural curiosities seem to be its rivers, lakes, and cataracts.

One of the most remarkable accidents which history records of this country, provided that it were satisfactorily ascertained, is the earthquake of the year 1663, which is said to have overwhelmed a chain of mountains of free-stone more than 300 miles long, and changed the immense tract into a plain. We shall enumerate and describe the principal towns, lakes, rivers, and cataracts of this country in their proper places.

Canada, bay of, lies on the east side of the island of Newfound, between White and Hare bays, which last lies north of it.

Canada creeks are three creeks of North America; one a water of Wood creek, which it meets four or five miles N. N.W. of Fort Stanwix, or New Fort Schuyler. The other two are northern branches of Mohawk river; the upper of which mingles its waters with the Mohawk in the township of Herkimer, on the German flats, 16 miles below Old Fort Schuyler, and is crossed by an ingeniously constructed bridge; the other empties into the Mohawk 13 miles below. Both these creeks are long, rapid, and navigable streams, and supply the Mohawk with a considerable accession of water. The lands adjoining them are rich and valuable, and furnish inviting settlements.

Canada, sea of, or sea of Huron, a name which might be given to the large inland sea, that is formed by the lakes,
Superior, Michigan, and Huron, and which is about 350 miles in length, and more than 100 at its greatest breadth. See each of these articles.

**CANADA Saginaw lake. See SAGINAW lake.**

**CANADENSIS, in Ornithology, a species of Tetrao, that inhabits Hudson's bay. The tail feathers are black, and at the tip tawny, and near the eyes are two white stripes. Ginel.** This is supposed by late authors to be the male bird of the Linnaean Tetrao CANACE, which is described as having the tail entire, with a white spot behind the claws and nofilis. Syst. Nat. ed. 12.

**CANADENSIS, a species of Axdea, or Heron of the hard kind, distinguished by the name of the brown crane of Canada among Hebrew authors. The forehead is naked and papillous; body cinereous; wings tellacious on the outside. Ginel. Obi. This is the brown and ash-coloured crane of Edwards, La Grue brune de Buffon, and La Grue de la Baie d'Hudson of Brissot.**

The length of this bird is three feet three inches. Bill three inches and three quarters long, of a dusky colour, with the tip of the upper mandible pale flesh colour. The top of the head is covered with a red skin thinly befeft with hairs; checks and throat whitish; head and neck cinereous; upper part of the back, fcapulars, and wing-coverts pale rufous margined with brown; breast, belly, thighs, and fides ash-coloured; tail deep ash; legs and bare part of the thighs black. This bird is peculiar to America. It subsists on corn, and Indian maize occasionally. Among the natives of North America it is known by the title of Samak-uchcheaux.

**CANAJOHARY, in Geography, a post-town of North America in Montgomery county, New York, seated on the south side of Mohawk river, and comprehending a large district of fine country; 40 miles W. of Schenectady, and 56 miles from Albany. In the late census of 1790, 730 of the inhabitants appear to be electors. A creek of the same name enters the Mohawk in this town. This was the principal post of the Mohawk Indians, and abounds with apple-trees of their planting, from which is made excellent cider.**

**CANAKAMPALEAM, a town of Hindooftan, in the Mysore country; 12 miles E. of Satticamugurn.**

**CANAL, Canal, in general, denotes a long, round, hollow instrument, through which a fluid matter may be conveyed. In which sense, it amounts to the same with what we otherwise call a pipe, tube, channel, &c. Thus the canal of an aqualung, is the part through which the water passes; which, in the ancient edifices of this kind, is lined with a coat of malleable of a peculiar composition.**

**CANAL, a duct or pipe (as its derivation from the Latin Caue, a cane, or reed, leems to imply), in which sense it is used by anatomists in describing the passage through which some of the animal fluids pass: the term Canal has also been applied to denote any piece of water, especially if of a considerable length in proportion to its width, and especially such as are navigable, or have not the fall and natural motion which rivers have. Canals may be either for pleasure or ornament, such as are common in the vicinity of palaces and great houses; or applied to the purposes of inland navigation. The artificial carriages for conveying streams of water for the supply of cities or other purposes, as was done by the famous aqueducts of antiquity, and in modern times by the new rivers near London, and others, have sometimes also been called Canals.**

**The importance and utility of canals have been so long and so generally acknowledged, that it is hardly necessary to introduce the subject with any observations to this purpose. Few persons have more attentively considered or better understood the political and commercial interests of nations than the late Dr. Smith; and no one could be a more zealous advocate for the extension of inland navigation, as an effectual means of improving the country, in which it is encouraged. To this purpose he observes, in his 'Wealth of Nations' (vol. i. p. 297), that good roads, canals, and navigable rivers, by diminishing the expense of carriage, put the remote parts of the country more nearly upon a level with those in the neighbourhood of large towns; and on that account they are the greatest and all improvements. They encourage the cultivation of the remote parts, which must always be the most extensive circle of the country. They are advantageous to towns, by breaking down the monopoly of the country in its neighbourhood; and they are advantageous to all parts of the country, for though they introduce some rival commodities into the old markets, they open many new markets to its produce. "It is not more than 50 years ago," says he in 1776, when the first edition of his work was printed, "that some of the countries in the neighbourhood of London, petitioned the parliament against the extension of the turnpike roads into the remoter counties. Those remoter counties, they pretended, from the cheapsale of labour, would be able to sell their grain and corn cheaper in the London market than themselves, and would thereby reduce their rents, and ruin their cultivation. Their rents, however, have risen, and their cultivation has been improved since that time." "All canals," says an intelligent writer on this subject (See Phillips's General History of Inland Navigation, Intro.), "may be considered as so many roads of a certain kind, on which one horse will draw as much as 30 horses on ordinary turnpike roads, or on which one man alone will transport as many goods as three men; and 15 horses usually do on common roads. The public would be great gainers were they to lay out upon the making of every mile of a canal twenty times as much as they expend upon a mile of turnpike road; but a mile of canal is often made at a less expense than the mile of turnpike. Consequently there is a great inducement to multiply the number of canals."**

The advantages resulting from canals, as they open an easy and cheap communication between distant parts of a country, will be ultimately experienced by persons of various descriptions: and more especially by the manufacturer, the occupier or owner of land, and the merchant. The manufacturer will thus be enabled to collect his materials, his fuel, and the means of subsistence, from remote districts, with less labour and expense; and to convey his goods to a profitable market. As canals multiply, old manufactures revive and flourish, new ones are established, and the adjoining country is rendered populous and productive. To the occupier of land, canals are useful in a variety of ways. In some cases, they serve the purposes of draining and of irrigation; in others, they furnish manure at a cheap rate; and they facilitate the conveyance of the produce to places where it may be disposed of to the greatest advantage. The land-owner must of course be benefited, by the increasing value and advanced rent of his estate, in consequence of the improvement it receives from the utility of the occupier, excited and encouraged by an immediate recompense. The wholesale trader and merchant are likewise enabled to extend their commerce by means of canals; as they can thus export greater quantities and varieties of goods from places remote from the sea, and easily supply a wider extent of inland coun-
country with the commodities that are imported from foreign nations. Nor are they merely the means of extending and increasing foreign commerce, but they serve also to create and augment an internal trade, which, with all the advantages attendant on foreign commerce, may probably far exceed it in extent, value, and importance. We might add, that an inland communication between parts of a country, at a great distance from one another, contribute to the security, as well as to the extension of commerce, in the boisterous months of winter, and in times of war, when the navigation of the seas would be attended with danger. "Were we to make the supposition of two states," says Mr. Phillips (ubi supra), "the one having all its cities, towns, and villages upon navigable rivers and canals that have an easy communication with each other; the other possessing the common conveyance of land-carriage; and supposing, at the same time, both states to be equal as to soil, climate, and industry; commodities and manufactures, in the latter state, might be exported 30 per cent. cheaper than in the latter; or, in other words, the first state would be a third richer and more affluent than the second." Should it be objected, that navigable canals waste or occupy too great a portion of land in the countries through which they pass, the objection may be obviated by the consideration, that one mile of a canal, 14 yards wide, takes up little more than five acres of land.

If we advert to fact, and consult the records of history with regard to the state of different nations, we shall find, that civilization and commerce have very much depended on the facility with which the inhabitants of remote districts have maintained intercourse with one another, as well as with distant countries. As the ocean serves to connect distant countries, navigable rivers and canals unite the different provinces and districts of the same country; and as navigation, by means of the ocean, produces an intercourse and mutual exchange of productions between different kingdoms, inland navigation, in like manner, facilitates a communication between different parts of the same kingdom, and consequently promotes trade and industry. In North America, the plantations have constantly followed either the sea-coast or the banks of the navigable rivers, and have formerly any where extended themselves to any considerable distance from the one or the other. The nations that appear to have been first civilized, were those that dwelt round the coast of the Mediterranean sea, which, from a variety of circumstances, was extremely favourable to the early navigation of the world. Of all the countries on the coast of the Mediterranean, Egypt seems to have been the first, in which either agriculture or manufactures were cultivated and improved to any considerable degree. Upper Egypt extends itself nowhere above a few miles from the Nile, and in Lower Egypt that great river breaks itself into many different canals, which, added by a small degree of art, seem to have afforded a communication by water-carriage, not only between all the large towns, but between all the considerable villages, and even to many farm-houses in the country: yearly in the same manner as the Rhine and the Maesë do in Holland at present. The extent or facility of this inland navigation was probably one of the principal causes of the early improvement of Egypt. The improvement in agriculture and manufactures seems likewise to have been of very great antiquity in the provinces of Bengal in the East Indies, and in some of the eastern provinces of China. In Bengal, the Ganges and several other large rivers form a great number of navigable canals, in the same manner as the Nile does in Egypt. The same is the fame in the eastern provinces of China, where several large rivers form, by their different branches, a multitude of canals, and by communicating with one another afford an inland navigation much more extensive than that either of the Nile or the Ganges, or perhaps of both of them united. It is remarkable, however, that neither the ancient Egyptians, nor the Indians, nor the Chinese, encouraged foreign commerce; but they all seem to have derived their extraordinary opulence from this inland navigation. On the other hand, those nations that have been delirious of the means of inland navigation, either by rivers or canals, have remained from one age to the other in the same barbarous and uncivilized state. This observation is exemplified in the state of all the inland parts of Africa, and of that part of Asia which lies at any considerable distance north of the Euxine and Caspian sea, the ancient Scythia, and the modern Tartary and Siberia. The commerce that may be carried on by means of a river, which does not break itself into any great number of branches or canals, and which runs into another territory before it reaches the sea, can never be very considerable; because it is always in the power of the nation who possesses that other territory to obstruct the communication between the upper country and the sea. Thus the navigation of the Danube is of very little use to the different states of Bavaria, Austria, and Hungary, in comparison of what it would be if any of them possessed the whole of its course till it falls into the Black Sea. To these general observations, we shall furnish a brief account of the principal canals that have been formed among the nations of antiquity, and among foreign nations in later times; reserving the principal part of this article for an enumeration of the canals of our own country, and for an illustration of the principles on which they are constructed, the regulations to which they are subject, and the various uses to which they are applied.

In the history of ancient nations we discover various trances of canals, formed for military, agricultural, commercial, or other purposes. The "foroantes Philistina" of Pliny (l. iii. c. 16.), which were large canals at the mouth of the Eridanus in Liguaria, are ascribed by Mr. Bryant to the Ca naenites, and particularly to the Caphtorim, who at a remote period migrated from Philistia; and hence these outlets of the river were named "Philistia." We learn from Herodotus (l. i. c. 174.) that the Cnidians, a people of Caria in Asia Minor, formed a design of digging a channel through the Íthmus which joined their territory to the continent; but they relinquished the undertaking, because they were interdicted by an oracle. Strabo informs us (l. ix. p. 465, &c.), that canals and pits were dug in Bactia, at a very remote period of antiquity, for drawing off the water of the lake Copais, which would otherwise have overflowed the whole country. This lake near the sea terminates in three bays, which advance to the foot of mount Pitous, situate between the sea and the lake. From the bottom of each of these bays numerous canals were made to diverge and traverse the mountain through its whole breadth, some of which were more than a league in length, and others of a much greater extent. For the purpose of excavating or of cleaning them, very deep wells had been sunk at slanted distances on the mountain. The labour of forming and the expense of maintaining these canals must have been immense. They have since been almost wholly neglected, so that most of them are choked up, and the lake seems to be gaining on the plain. The inhabitants of Babylonia or Chaldæa guarded against the detrimental inundations of the Tigris and Euphrates by a great number of artificial rivers and canals, which served to distribute the waters, to benefit the country in
in general, and to effect an easy communication and intercourse between the occupiers of different parts of the country. The Euphrates, according to Ptolemy (l. v. c. 17.), above Babylon, near a town in Mesopotamia, called Siphiara, divides itself into two branches, one running to Babylon, and the other to Seleucia, where it falls into the Tigris.

The latter, from Pliny (l. xi. c. 26.), was partly artificial; and he places Seleucia at the commencement of the Tigris, adding that the Euphrates was conveyed to it by a canal. Ptolemeus, (Cons. h. i. part. ii. p. 107;) on his authority, supposes that branch to have been artificial, and ascribes it to Nebuchadnezzar. Between these two branches an artificial canal was cut from the Euphrates, above Babylon, to the Tigris at Apamea, 60 miles below Seleucia. This canal, which was large and navigable, was called Naxorabdris, which see. From the Naxorabdris the emperors Trajan and Severus, in their wars with the Parthians, dug a new canal to the Tigris, near Cocius on the wall, and Tersiphon on the call side of that river. At the distance of 500 furlongs from Babylon, to the south was another canal, called by Arrian (Exped. Alex. l. vii.) Pallacippus, and by Appian (Bell. Civil. i. ii.) Pallacippus, derived from the branch of the Euphrates that fell through Babylon and conveyed water to certain lakes or marathes in Cilicia. On this canal, or river, as Arrian calls it, Alexander failed from the Euphrates to these lakes. Strabo (l. xvi.) describes the course of this canal, without naming it. But it is impossible to trace out, with accuracy, thele and the other numerous branches and canals which watered the ancient country of Babylon, which see. Many of those that were formerly considerable are now lost; and others have been formed since, that did not exist in ancient times; for a country so much watered, so low in situation, and so subject to the violence of extraordinary inundations from the two large rivers, the Tigris and Euphrates, and so neglected as it has been for several ages, must have often and very considerably changed its face since the time of Ptolemy; and it is almost impossible to describe it as it was while it continued to be the seat of empire, when the inhabitants were rich enough to take care of its numerous banks, and to keep them in repair. See BABYLONIA.

Both the Greeks and Romans proposed to make a canal across the isthmus of Corinth, which joins the Morea and Achaia, and thus to make a navigable passage by the Ionian sea into the Aegea. Demetrius Poliorcetes, Julius Caesar, Nero, and Caligula renewed the attempt, but without success. Plin. l. iv. c. 2. After the death of Alexander the Great, Seleucus Nicanor attempted to make a canal between the Euine and Caipian seas, but he undertaking proved abortive. Travellers, however, assure that traces of very deep vallies are to be seen, through which the canal is said to have passed. Selim III. and Peter the Great, renewed the attempt, but they were prevented from succeeding, not so much by the impracticability of the scheme as by other collateral circumstances. The Romans, more intent on conquests than on commerce and the arts, afforded us few instances of canals for internal navigation. We find, however, that Drusus, under the emperor Augustus, having conceived the design of marching into Germany without harrying his troops by a long and difficult march, facilitated the execution of it by making a canal that communicates from the Rhine with the Ielch, extending from the village of Egelto to Doebourg. This canal received a great part of the waters of the right branch of the Rhine, which became by that means much less considerable. At the same time he opened a third mouth from that river into the sea, mentioned by Pliny under the name of "Fluviam Olifium." But the face of the country has been much altered from that time. Lu...
Necos, the son of Pharnamcticus, and continued by Darius king of Persia; but left imperfect in consequence of the advice of some persons who affected that it would lay Egypt under water, because the land was below the level of the Red sea. Ptolemy II., however, finished the undertaking, and constructed, in the most convenient part of the canal, a dam, or sluice, ingeniously contrived with pipes and sluices, and immediately closed again. Hence the river which discharges itself into the sea, near the city of Arisinoe, has received the name of Ptolemy. From this sluice, says baron De Tott, it is plain, that the sluices still existed in the time of Diocondus. The entrance of the canal near Suez yet remains, and might easily be restored navigable, without employing sluices or locks, as the difference of the level is very small, and without endangering Egypt with inundations. This part of the illusmus, says the baron, affords land very favourable for such an excavation, through the small interval of 12 leagues, which separates the Arabian gulf from the arm of the Nile which approaches it; and afterwards falls into the Mediterranean at Timch. Strabo adds (ubi supra) that this canal was afterwards cleansed by Trajan. Its width, being 100 cubits, of 22 inches to a cubit, was sufficient for admitting the passage of two galleys abreast; and its depth was such as to bear the largest vessels. Phiny, in his account of this canal, (lib. vi. cap. 29.), states its breadth at 100 feet, its depth at 40, and its length to the bitter fountains (near Arisinoe) at 37 miles. By means of this canal, the valuable commodities of India, Persia, Arabia, and the kingdoms on the coast of Africa, which were brought by sailing to the Red sea, were conveyed to the Nile; and thence distributed by the Mediterranean not only to Greece and Rome, but to all the surrounding nations, until the Portuguese discovered a passage to India by the Cape of Good Hope. It did not, however, long serve the useful purposes of commerce, which were at first expected. Merchants were dissatisfied with the delay occasioned by going to the very bottom of the gulf, and afterwards with the inland navigation of the canal, and that of the Nile, to Alexandria. They found it much more expeditious to unload at Berenice, near the coast of the Red sea (see Berenice) and after three days' journey, to send their merchandise directly down to Alexandria. Accordingly, this canal was disused, and goods were conveyed from Berenice to the Nile by land; a mode of conveyance occasionally used at this day. Strabo and others have asserted, that this canal was again opened about the year 635, by Amru, governor or prefect of Egypt, under the caliph Omar, for the conveyance of the corn of Egypt to Arabia, which was then grievously distirred by a famine. Elmacin, or Al Makin, says, that a new canal was opened for this purpose, and called by Amru the river of the emperor of the faithful; but it has been more generally supposed, that he only restored the ancient canal, the navigation of which, towards the decline of the Roman empire, had been much neglected. The authors of the Modern Universal History (vol. i. p. 333.) discred the relation of Elmacin and Eutychius; and allege that there never was any passage for vessels dug between the towns of Al Pollat, on the eastern bank of the Nile, and Al Kolzom or Colzum on the Red sea. The river, or rivulet, denominated by them the river of the emperor of the faithful, may these authors, was undoubtedly no other than the Amnis Trajanus of Ptolemy, or the Khalig, which annually supplies the city of Cairo, as well as the neighbouring country with water. For the present state of this canal, see Cairo. They suppose, therefore, that, on the occasion now referred to, the caliph Omar ordered Amru to make the Khalig more navigable, by clearing it of the gravel or sand with which it was then choked up; and that, for this reason, it received the name of the river of the emperor of the faithful. Elmacin further informs us, that the Alexandrian canal was flopped again, at the end next the Red sea, by the caliph Abu Jaafar, or Almanzor, in the year of the Hegira 150, A.D. 767. Some traces of this canal arc still fulfilling; and M. Boutier, in 1762, discovered that end of it, which riles out of the most easterly branch of the Nile. Hist. Acad. Sc. for 1763, p. 115, &c.

The canal of Alexandria, cut from the Nile to this city by Ptolemy, during the inundation of the Nile, receives its water at Latf, opposite to Founah, and has three bridges over it, of modern construction. Near the former, by the sea-fide, is the entrance of the subterraneous aqueduct, that carries a supply of water for the Alexandrians into the cillerns, the arches of which supported the whole extent of the ancient city, but they are now incapable of being traced out. The mouth of this aqueduct is now blocked up; but when the water of the canal had arrived to a certain height, in consequence of the rise of the river, the principal magistrates of the city went in great ceremony to break down the dam. When the cillerns were full, it was again built up, and the water of the canal continued to fall into the fan at the old port. It was by this easy communication that merchandise was formerly conveyed through Egypt. The dangerous passage of the mouth of the Nile was thus avoided, as well as the perils of the sea. But beside furnishing the city with water, and facilitating its commerce, this canal, which passed along the upper part of the cultivated lands, on the left hand of the Nile, contributed very much to their fertility. In process of time it was shamefully neglected. However, it was cleansed by order of Bonaparte, in his irruption into Egypt, as far as Rhamania. See Alexandria.

Egypt is intersected in various directions by many other canals. Several of them issue from that arm of the Nile which runs to Damietta, and contribute to facilitate the province of Sharkin, which, making part of the illusmus of Suez, is the most considerable of Egypt, and the most capable of a great increase of cultivation. Others run through the Delta, and of these, says baron De Tott, many are navigable. The canal of Menouf communicates with the two branches of the Nile, 10 leagues below the angular point, called the "Belly of the cow." See Menouf. The canal of Bahira proceeded from the lake Marcotis, near Alexandria, and having sent off branches which joined the western branch of the Nile at Eihim, Shabur, and Nadir, passed on to Upper Egypt. The other principal canals of Egypt will be mentioned in connexion with the towns or districts to which they belong.

There is no country on the face of the globe that abounds more with canals and navigable rivers than China: to which article we shall refer an account of its inland navigation. Hindooftian likewise furnishes instances at a remote period of the acknowledged importance and utility of canals. As the country between Delhi and the Panjab was formerly supplied with water, the emperor Feroce I., who died in 1388, undertook, says major Rennell (Memoir, p. 71.), the noble, as well as useful, task of supplying it better, and at the same time of applying the water, so furnished, to the purposes of navigation.

The immediate object of the canals, projected and executed by Feroce, for an account of which we refer to Ren- niel (ubi supra) seems to have been the junction of the Seo- lege and Jumna rivers, through an interval of 240 geographical miles, and remotely that of the Indus and Ganges. If this grand design of Feroce had been completed, it must have ranked with the greatest works of this kind; "for we should
C A N A L.

should then have seen two capital rivers, which traverse a large part of Southern Asia, which enter the sea at the distance of 1,500 British miles aounder, and which directed their arms, as it were, to meet each other, united by art: and those by nature to a third; so as to form an uninterrupted inland navigation from the frontiers of China to those of Persia." The country of Bengal is so interlinked in various directions by the natural canals of the Ganges and Burunpooter rivers, together with their numerous branches, as to form the most complete and only navigation that can be conceived; and it is supposed, that this inland navigation furnishes constant employment for 50,000 boatmen, who are employed in conveying by water through the kingdom of Bengal and its dependencies, all the salt and a large proportion of the food consumed by 10,000,000 people, and in transporting commercial exports and imports, probably to the amount of 2,000,000l. sterling per annum.

The improvement of inland navigation engaged but little attention in Russia before the reign of Peter the Great. With him, after his return from Holland, where he had observed its useful effects, the construction of canals became a principal object. Of those projected and hastily executed by him, we may mention that of Cronstadt, that of lodoga, that of Vihiine-Volohok, and that for forming a communication between Moscow and the Don. For an account of the canal of Cronstadt, which was left unfinished by czar Peter, see Cronstadt. The Ladoga canal was begun in 1728 by his order, and finished during the reign of the empress Anne. It was carried out first only as far as the Ka-bono, a rivulet which enters the lake to the call of Schulsfelfburg; but now reaches, without interruption, from the Volkof to the Neva. The length is 67 1/2 miles, and its breadth 70 feet; the mean depth of water in summer is seven, and in spring ten feet; it is supplied by the Volkof and eight rivulets. The banks enter through the ditches of the Volkof, and go out through those of Schulsfelfburg. In 1778, four thousand nine hundred and twenty seven vessels passed through this canal. A scheme has been projected, and in part executed, for uniting the White Sea and the Baltic, and thus improving the commerce between Archangel, Peterburgh, by forming a communication between the Ladoga and Bilo-Ozero to the Dura. The canal of Vihiine-Volohok, forms a communication by water between Africcan and Peterburgh, or between the Caffian and the Baltic. This canal was begun and completed under Peter the Great; but it has been considerably improved by the empress Catharine, so that vessels reach Peterburgh in half the time which they formerly employed. In order to form an idea of the course of this inland navigation, a map of Russa should be consulted; and it will be seen, that the river Shina forms the lake Malfino, which gives rise to the Mastra; this, after a course of 224 miles falls into the lake Ilmen, from which issues the Volkof; and this, running 130 miles to the lake Ladoga, supplies the Neva; so that, in effect, the Shina, the Mastra, the Volkof, and the Neva, may be considered as the same river flowing into and through different lakes. By uniting, therefore, the Shina, which communicates with the Baltic, with the Tvertza, which flows by the Volga into the Caffian, the canal of Vihiine-Volohok completes the communication between these two seas. In autumn the navigation from Vihiine-Volohok to Peterburgh is performed in little more than a month; in summer in three weeks. In one year 3485 banks have passed through this canal.

The grand project of uniting the Caffian and the Baltic with the Black Sea, by the junction of the Don and Volga, was planned by Peter the Great. These two rivers approach each other within the distance of 10 miles in the present of the Caffian; and two rivulets, the Holma which joins the Don at the Caffanmouth lying into the Volga, are separated by an interval of five miles. If these rivulets could be made navigable, and united by a canal, the Black Sea would be joined with the Caffian and Baltic. Repeated attempts have been made for this purpose, but they have hitherto failed. However, as the Volga and the Don are but 40 miles distant, and land carriage in this country is very cheap and safe, the advantages resulting from the projected canal would be scarcely equivalent to the expense of forming it. In 1687, a beautiful chart was published, exhibiting a view of all the canals in Russia, that have been formed between the White and Black Sea, and between the Baltic and the Caffian. The inland navigation is already carried through such an extent in Russla, that it is possible to convey goods by water, 4472 miles from the frontiers of China to Peterburgh, with an interruption only of about 60 miles; and from Africcan through a tract of 1474 miles. Cox's Travels in Poland, Russia, &c. vol. iii. Tookes view of the Russian Empire, vol. i.

The first sovereign of Sweden, who duly appreciated the utility of inland navigation, was Guillaume Vafla. Having made Lodock (now Gothenborg) a staple-town of trade, he conceived hopes, that in order to prevent the merchandise bound to Sweden from being obliged to sail through the Sound, the merchandise might, at some future period, be transported from thence to Stockholm, by means of the Wener, Hielmar, and Maeler, when the rivers and lakes uniting with them should be rendered navigable. Eric XIV. disinclined to executing his father's plans, directed a survey to be made of the waters communicating with those lakes, and plans to be formed for joining them by artificial canals. But the turbulence and misfortunes of his reign frustrated the accomplishment of his desine. The same object was kept in view by succeeding sovereigns. Charles IX. promoted it by the Carlignf canal, and Charles XI., by that of Arboga. Guillaume Adolphe wished to encourage the design, but could not find persons competently qualified to execute it; and Charles XI. was discouraged by the report of Dutch engineers, who declared it impracticable. Charles XII. however, approved the proposal of the celebrated engineer, Polhem, for rendering the eataracts of Trolsbatta navigable, and for opening a communication, not only between Gothenborg and Stockholm, but also with the Wener, the Vette, and Nordkoping, sufficient for the passage of large vessels. The execution of this plan was immediately begun by his order, and, after his death, revised by Adolphus Frederic. It comprehended three principal parts; viz. the junction of the Maeler and the Hielmar, of the Hielmar and Wener, and of the Wener with the German Ocean. The two lakes of the Maeler and Hielmar are united by the Ulvson, and the canal of Arboga. This canal (see Arboga) is, for the most part, of sufficient breadth to receive two banks a-breadth, and its lowest depth is eight Swedish feet. It is chiefly supplied with water from the lake Hielmar, which is 80 feet higher than its level; and this fall is broken by eight sluices. With a view of joining the Hielmar and Wener, many schemes were proposed, but difficulties occurred which prevented the completion of them. The junction of the Wener with the German Ocean has been attempted by the Carlignf canal, the canal of Trolsbatta, and the sluices of Akerstram and Edet. The Carlignf canal, so called from Charles IX., who commenced it, connects the Wener with that part of the Gotha, where it is first navigable. In 1758 a new sluice to supply the place of that of Polhem, carried away by the water, and of that called
called Tellin, found insufficient, was completed; and demonstrated the efficacy of Gustavus. This superb work is a cut of 200 feet, partly perforated through the solid rocks, and consisting of two locks, each 200 feet long, and 36 broad; the sides being strongly faced with brick and stone. The greatest depth of water is 13, and the lowest 6 feet. This canal is commonly navigated by vessels of 80 tons burden. From the end of this canal to the village of Trolhatten, including an interval of five miles, the navigation of the Gotha is interrupted; but when it burths at once into the cataracts of Trolhatten, called the "gulls of hell," all further navigation becomes impracticable through a space of about two miles. Here it is divided into four principal cataracts, separated by whirlpools and eddies, and descending through a perpendicular height of 100 feet. Nevertheless, an attempt has been made to form a canal through these cataracts. The first attempt, after much labour and expense, failed; and another plan was adopted. The length of the canal was to be 1970 feet, its breadth 36, and its depth in some parts above 30; and it was to consist of nine aqueducts; but the whole of the cut was to be excavated through a bed of red granite; and though it should not be condemned as impracticable, the difficulties attending it appear to be almost insuperable. After all, it has been doubted, whether the enormous expense attending the execution of it will be compensated by the advantages resulting from its completion. Gustavus III., soon after his accession, visited the works, and ordered all of them to be suspended, except the flues of Gustavus and Aker. But, in order to facilitate the conveyance of merchandise from the districts bordering on the Wener to Gotheborg, a wooden road has been constructed on the side of the river, from the beginning to the end of the cataracts. About a mile below the cataracts, the course of the Gotha is again interrupted by a fall, called Akerlarm; and here a canal has been made through a rock, 185 feet long, including the fluce, 26 deep, and 36 broad. From Akerlarm the river is clear to Gotheborg, excepting at Edet, where it is intercepted by a bed of rocks. On one side of these rocks another cut has been made, 600 feet long, 20 deep, and 18 broad. The iron and other merchandise are now transported across the lake to Wenerborg, through the Cargraf canal, and down the river Gotha to Trolhatten. At the cataracts they are unloaded, carried over the wooden road two miles to the end of the falls, again embarked, and passing through the Akerlarm and Edet fluces, arrive without further impediment at Gotheborg.

The principal canal of Denmark is that of Kiel. This canal was designed to complete the inland navigation, which, for the purpose of facilitating the communication between the Baltic and the German Ocean, is formed across the duchy of Holstein, and it unites with the river Eyer, which passes by Rendsburg, and falls into the German Ocean at Tonningen. It begins about three miles N. of Kiel, at the mouth of the river Lauenfawke, which heretofore separated Holstein from Schleswig, and will become a new boundary between these two duchies. The distance from its beginning to the fall fluce at Rendsburg is 27 English miles; but as the Eyer is navigable about 66 miles above Rendsburg, the cut necessary for completing the communication between the two seas is only 204 miles. It was begun in 1777, and was opened in 1785. The perpendicular fall towards the Baltic is 25 feet six inches; that towards the ocean 23; and the vessels will be raised or let down by means of six fluces. The breadth of the cut is 100 feet at the top, and 54 at the bottom; the fluces are 37 feet broad and 100 feet long, and the lowest depth of water is 10 feet. Merchants of about 150 tons burden will be able to navigate this canal. The utility of this important undertaking is indisputable. At present, even the smallest vessels, trading from any part of the Danish dominions in the Baltic to the Northern Sea, must make a circuit round the extremity of Jutland, and are liable to be detained by contrary winds. This navigation is so tedious, that goods shipped at Copenhagen for Hamburg are not usually sent by sea only to Lubeck, and from thence by land. The object, says Mr. Coxe, of those who planned this canal, was to draw by Kiel into the Baltic, the commerce of Bremen, Hanover, and Wollphalia, which is now carried down the Weter, and by Glückstadt upon the Elbe, to Hamburg and Lubeck; and to facilitate the transport of merchandise from Holland and the North Sea to the ports of the Baltic. But the difficult navigation of the Eyder between Rendsburg and Tonningen, occasioned by numerous shoals of shifting sands, will prevent the complete success of this canal. Ships sailing from the Baltic to English or French ports, will without doubt prefer the navigation round the Cattegat, with all its dangers and difficulties. The trade of Kiel, however, will at all events be greatly increased by this canal; but the principal repository of the merchandise will be at Rendsburg. Coxe's Travels, vol. v.

The canals of Holland and Flanders are innumerable; and they serve the purpose of our public roads, so that the inhabitants may travel by means of them in their trechfuyts and barges, and convey commodities for consumption or exportation, from one part of the country to another, as occasion requires. An inhabitant of Rotterdam, it is said, may, by means of these canals, breakfast at Delft or the Hague, dine at Leyden, and sup at Amsterdam, or return home again before night. By them also a prodigious inland trade is carried on between Holland, France, Flanders, and Germany. When the canals are frozen over, they travel on them with skates, and perform long journeys in a very short time, while heavy burdens are conveyed in carts and sledges, which are then as much used on the canals as in our streets. The profits which have accrued from these canals have been immense; and their amount almost exceeds belief. It is said, that they have yielded more than 250,000L. for about 40 miles of inland navigation. The canals of Holland are generally 60 feet wide, and fix deep, and are kept cleansed; the mud, as manure, being very profitable. They are generally level, and need no locks; and they are commonly elevated above the country for the purpose of carrying off the waters, which in winter inundates the land. In the province of Delfland, not more than 60 miles long, 200 wind-mills are employed in spring to raise the water into the canals. On the dunes or banks by which they are bordered, and which are kept in repair at a very considerable expense, depends the security of the country from inundation. The canals of Flanders, ever since their trade has declined, and the cities erected on their banks have decayed, have been very much neglected. They indicate, however, the former flourishing and prosperous state of the country. So early as the 12th century, large canals were cut; and they answered the purpose of inland commerce as well as of draining the land. The spacious canal of Bruggis, begun in 1531, and completed in 1560, extends from this city to the Scheldt, which opens a communication with Holland, and by the canals of Flanders with the ocean. The canals of the other Dutch and Flemish towns will be mentioned under their respective articles.

France has from a very distant period exercised its ingenuity and activity in the construction of canals for inland navigation. We must content ourselves with a cursory mention
A Canal.

mention of some of the principal. The canal of Briare, called also the canal of Burgundy, was begun under Henry IV. and finished in the reign of Louis XIV. It opens a communication between the Loire and the Seine, and then between Paris and the western provinces. Commencing at the Loire near Briare, it parallels Montargis, joins the canal of Orleans, which was begun in 1677, and has 22 miles, and falls into the Seine near Fontainebleau. It has 42 locks and sluices; and is of great use in inland commerce. The canal of Picardy connects the river Somme with the Oise; and beginning at St. Quentin, joins the Oise, and affords a ready conveyance to Paris for the grain of Picardy, the seasonal, wood, butter, copper, and spices from the northern provinces of the kingdom, and from Holland. The most considerable work of this kind is the canal of Languedoc, called the canal of the two seas, which forms a junction between the Ocean and the Mediterranean. It was first projected under Francis I., but begun in 1666, and finished in 1681, under Louis XIV., during the minority of Colbert, and by the skil of Riguet, the engineer. It established a ready communication between the two fertile provinces of Gienne and Languedoc, and extends from Carcassonne to the Garonne below Toulouse, being provided at proper intervals with 114 locks and sluices. In some places it is conveyed by aqueducts over bridges, under which other rivers pursue their course. Near the town of Beziers, it was conveyed under a mountain by a tunnel, then thought singular and extraordinary, but now common, 730 feet in length and lined with free stone. At St. Feriol it derives a supply of water from a reservoir containing 555 acres. Its breadth is 14 feet, including towing-paths; its 16 feet deep, and its length 64 French leagues, or about 180 miles. The expense of its construction was about 52,900l., defrayed partly by the king, and partly by the province of Languedoc. On the reduction of the army and navy in 1782, after the conclusion of the American war, the disbanded soldiers and seamen were employed in the construction of three navigable canals; viz. one, called the canal of Deune, extending from Chalon-sur-Saone to the town of Dijon on the Loire, through an interval of 21 leagues, and forming a junction with the Saone and the Rhone: a second, called the canal of Burgundy, reaching from St. Jean-de-l'Aine to the village of Roch, between St. Florentine and Joisy, through a space of 52 leagues, and opening a communication between the Saone, the Rhone, the Yonne, and the Seine; and a third, called the canal of Neuf-Brislach, which commences at the village of St. Symphorien, on the Saone, and passing the city of Belançon, is continued below Strohburg, forming a junction of the Saone with the Rhone, and of the Ill with the Rhine. By these canals goods may be conveyed at a cheap rate from Marseilles, the Mediterranean, Italy, and Switzerland, to the bay of Biscay and the Ocean, and also to Holland and Germany, as well as to Flanders and the Austrian Netherlands; and during any future war with England, France will be able to supply, by these canals, her dock-yards at Marseilles and Toulon, and also her grand arsenal and dock-yards at Breid and Rochfort, with all sorts of commodities from the Baltic, without hazarding a voyage by sea. It would be endless to enumerate all the canals, projected or actually executed in France, and forming an easy intercourse between the different districts of this extensive country. A survey has lately, in 1802, been made of the little river Buzeg or Bureg, with a view of its being brought to Paris in the same manner as the New River is brought to London, and of being laid into the streets and houses by pipes, fire-plugs, and engines, for the purpose of cleaning the streets, as well as accommodating the houses. Phillips's Inland Navigation, p. 75. 8vo.

Spain has not been altogether inattentive to the improvements likely to result from inland navigation. At former periods it has been often proposed to drive a canal through the province of Daren, from Nime to Duero, and thus to make a ready communication between the Atlantic and the South Seas, and to open a straight passage to China and the East Indies. The project, however, has been considered as chimerical, and treated with ridicule. The improvements meditated at home are of much greater importance: but though the inland navigations of Spain have been commenced upon principles both of grandeur and utility, they have been suffered to languish through the want of resources, and the tardy measures of the court. The great canal of Arragon afforded, in 1785, some hopes; but it seems to remain in an imperfect state. Two branches, however, are completed: those of Taudete, and the imperial canal, both of which begin at Navarre and terminate in the river Ebro, and they have already proved sources of industry to all the districts through which they flow, and rendered the fields fertile. One of these canals is conducted over the valley of Kinjalon, by an aqueduct 710 fathoms in length, and 17 feet thick at the bottom. Another canal called the canal of Caltile was projected to begin at Segovia, about 40 miles N. of Madrid, and to extend to the bay of Biscay, through a distance of 140 leagues. This canal is 56 feet wide at the top, 20 feet at the bottom, and nine feet deep, but the completion of it will require many years. The canal of Guadarama was planned in 1754, and being conducted with spirit, is probably now completed. It was to commence at the foot of the mountains of Guadarama, near the Ecuatorial, and to proceed to join the Tagus, afterwards the Guadiana, and terminate at the Guadiana, above Anduxar. Another canal was also begun to join the river Manzanares to the Tagus; but the work was suspended. The canal of Murcia was found, after its commencement, to be impracticable. Phillips's Inland Navigation, p. 75, &c.

The Americans possess a country capable of great and easy improvement by internal navigation. To this object they are not inattentive. For an account of their projects and actual progress in this business, we must refer to Phillips's Inland Navigation, p. 571, &c., or to the Journals of Mr. Elkanah Watson.

Canals, the Britifh, from the great influence which they appear to have had, among other canals, during the last half century, in promoting the rapid increase of our commercial greatness as a nation, have induced us to lay before our readers a very full account, not only of the present existing canals, but of the principles and practice of canal making, in the united kingdoms. As very few of the English, Welsh, Scotch, and Irish rivers, are of sufficient magnitude, and free from shoals, to answer the purposes of navigation far into the country from the sea, without the aid of art, conducted upon similar principles to those used in canal making; and as nearly all our canals connect with the navigable rivers, and act in some measure, as extensions of them further into the country, we have found it expedient to include under this article, whatever we have been able to collect on the subject of the Inland Navigation of the United Kingdom.

That the navigation of our rivers, by ships or smaller vessels has long been an object of considerable importance, will appear from magna charta, which has made a special provision in the 23d chapter, for the putting down of weirs and other obstructions in the rivers of England; and from Stat. 25 Edw. III. c. 4. which fets forth, that "whereas the common
The general laws of the land proving so very ineffectual for protecting internal navigation from the encroachments of individuals and the effects of neglect, this probably suggested the propriety of those particular grants or statuts which we find enabling corporations, and in some instances individuals, to take particular rivers under their charge, and to receive tolls or dues from the vessels navigating within their particular district. In process of time, as population increased, and the advantages of water carriage became more apparent, further grants and acts of parliament were made, authorizing companies or individuals to extend the navigation on certain rivers further into the country, generally to reach some city or great town; these acts, some of which we shall particularize hereafter, generally enabled the parties to deepen, and in some instances to straighten the course of their rivers, to embank them where too wide, to erect jetties and sluices, to make shallows into navigable waters; and in later times to erect pound-locks for gaining the access to the different mills-dams upon the river. But the consequent tendency of rivers being specially rapid ones, to call up banks of sand or gravel in particular places, their deficiency of water in times of drought, and superabundance in times of flood, the ravaging effects of these last in destroying the works erected for the use of the navigation; as happened on the river Aven between Crilchurch and Salisbury; on the river Stour, between the Severn and Streetbridge; on the river Calder, between Wakefield and Edland, and on several others which might be mentioned; the great labour and difficulties of towing or dragging vessels against the stream, especially where there was not a towing-path for horses near the channel of the river, and yet not subject to be overflowed and rendered useless in times of floods; the very lengthened course of mill rivers, arising from their serpentine, and, in some instances, varying channel, was not also among the smallest of the difficulties attending them: these, at length, suggested the propriety of leaving the bed of the rivers in some instances for a new cut for the navigation across, or at least, in some, of land, with a pound-lock at its lower extremity. As these side cuts and pound-locks were increased in number, to shorten the course of the rivers, their superior advantages be-

 came so apparent, that a company of gentlemen and merchants, who had in 1755 obtained an act of parliament authorizing them to make Sankey Brook navigable from the Mersey river to near St. Helens, in Lancashire, with the powers at that time usual in navigation acts, for the purchasing of land and other things necessary for the intended navigation, at a fair estimate to be made by commissioners named in the act; they determined, after mature deliberation, to avoid the bed or channel of the brook altogether, and to make one entire new cut or canal, as near as convenient to the bed of the river, with locks therein, in such places as the falls of the ground should render necessary; and this canal they accordingly effected about the year 1760, supplying its highest pound or level with water, by a cut or tender from the Brook. Thus navigable canals had their rise in England; but, a less fortunate set of gentlemen, who under the power of an act obtained in the year 1735, for making the river Stroudwater navigable, from the river Severn to near the town of Stroud, although the act empowered them "to make as many new cuts as they may judge proper, and of what length and breadth they shall think convenient"; yet when they had, about the year 1774, determined upon following the example of the Sankey proprietors, and in imitation of the duke of Bridgewater's, and several other canals, which had then been executed or were begun; by cutting a canal on the side of the Stroudwater river, they were flopped by an expensive law-suit, carried on by certain mill and land-owners in the neighbourhood: whereby the distinction between the river navigation acts, and canal acts was established by the Court of Exchequer, before which the case came to be argued.

About the year 1757, the Duke of Bridgewater, acquainted fully, no doubt, with what had been near 80 years before effected, on the canal of Languedoc, in the South of France, and since in different parts of the Continent, conceived the idea of a canal for the purpose of conveying coals from his estate at Workley in Lancashire, to Salford near Manchester. His grace, profiting as no doubt he did, by the works of that great French engineer, Francis Regnaud, and by the advice of that great natural and self-taught genius James Brindley, whom his grace called off, about the year 1756, from his employment as a millwright and engineer-maker in this country, to perfect, and carry into execution, the great and important schemes which he had projected, and for which he proposed and brought into parliament the first act, with powers adequate to the great and extraordinary undertaking, of cutting a canal of several miles in length, not in the direction of any river or stream of water, but crossing the course of several brooks, roads, &c. and through the lands of a vast number of different persons, all of whom were to be fully compensated, though deprived of the power of withholding their lands or waters, or in any way obstructing the design. In these respects, the Duke of Bridgewater has not improperly been called the father of canals in England, while his engineer, the late Mr. Brindley, by his skilful performances on the Duke of Bridgewater's canal, altered and extended as the scheme thereof was, by three subsequent acts of parliament, has secured to himself, and well it should seem, from a comparison of the great features, and minutiae of execution in this the first canal, with most others in this country, even of the latest construction, long continue to hold, that rank among the English engineers, to which Mr. Riquet seems entitled among foreigners.

The canal was happily opened by the Duke of Bridgewater, was quickly followed by new sets of adventurers, who were seen applying to parliament in almost every session for powers to make a joint lock on transferable shares, and
to make and maintain canals in most parts of the kingdom, many of which have been long completed, as our subsequent account of them will show, and have contributed in a most eminent degree to the improvement of the country, as well as to the enriching of the individuals concerned in a great number of the inhabitants; in the laudable zeal of adventurers to extend, and of the people of great towns and proprietors of mines and great manufactories to receive, the benefits of inland navigation. Numerous schemes have been adopted, where from the actual scarcity of water, or its previous appropriation to mills, a canal with locks was impracticable. One of the first of these schemes for dispelling with locks, was that of Mr. Bridge, about the year 1759, upon the Stroudwater river before mentioned, where the cargoes of the boats were dispensed in a number of boxes or frames, just adapted to the size of the boats; which boxes of goods were drawn up by cranes to be lodged in other boats on the higher level, and the reverse in descending; which method was afterwards more successfully practiced on Bridgewater’s canal at Worlesley, at Bickley Hill on the Shropshire canal, and other places. The next mode seems to have been adopted by Mr. Davis Dredkarl, near the Tyronese colloquies on the intended connection with Blackwater navigation in Ireland, about the year 1776; and afterwards by Mr. William Reynolds on the Killey canal, where the boats were dragged up or let down inclined planes, not very different from the rolling bridges, long before in use in Holland and Flanders. The necessity of an expedient and cheap mode of conveying coals from the pits to the keels or ships, had, as early as the year 1680, introduced the use of wooden railways, for the wagons to move upon, between the Tyne river and some of the principal pits, and these by degrees became extended to a great number of other coal-works. Since the more general introduction of cast iron, and its cheaper conveyance by means of canals, iron rails have been substituted in the place of the wooden ones before mentioned, and the use of inclined planes, or parts of the railway, having a much greater declivity or slope than it is practicable to drag carriages up by means of horses, has become very frequent in places where the rise of the ground required it, machinery being on these inclined planes adopted to supply the place of horses.

Several years ago, an act of parliament was obtained by Homfray, Hill, and Co. for an iron railway, or tram-road from Cardiff to Merthyr, by the side of, and as a rival scheme of the Glamorganshire canal, for nine miles or more in length; since which, several other acts have been passed for railways, and several of them executed, to the great benefit of the country, and the companies who constructed them; it has also become common within the same period, to authorize canal companies to construct railways, as collateral branches from their canal, to mines or other great works or to large towns within a certain distance of such canals; by which their benefits have been amazingly extended; most of the latter acts have also authorized the adoption of railways, of inclined planes, or of any of the expedients above-mentioned, or as substitutes for locks, in such parts thereof, as are not readily to be supplied with water, adequate to the waif which locks occasion. So many of these compound schemes for lessening the expense of carriage have been already executed, or are in hand, that we have found ourselves compelled, in order to prevent our readers with a connected and useful view of the subject, to include what we have to say on the subject of rail-ways, in the present article, as well as treat therein of navigable rivers, for the reasons before stated.

Great Britain as well as every other island, and even a continent taken as a whole, has a range of high land passing nearly its whole length, which divides the rivers and strait waters that fall to the opposite coasts; we shall call this range dividing the eastern and western rivers of Britain the grand ridge, and shall in our accounts distinguish it in which one, or how each canal is situated, in respect thereof; and here it will be proper to remark, that no less than 30 of our canals now do or are intended to pass this grand ridge, forming as many navigable connections between the rivers of the east and west! these are the Liffey and Foss William, Forth and Clyde, in Scotland; the Leith and Liverpool, Rochdale, Huddersfield, Trent and Mersey, Staffordshire and Worcestershire, Wey-ley and Eppington, Birmingham, Dudley, Worcester and Birmingham, Stratford, Warwick and Birmingham, Coventry, Grand Junction, Oxford, Thames and Severn, Wilts and Perks, Kent and Avon, Dorset and Somerset, Grand Western, and Bude and Launceston in England; and what is not a little remarkable is, that the Dudley canal crosses this grand ridge twice, the two ends being on the eastern side, and the middle part on the western side thereof; the Kent and Avon crosses the eastern and western branches, into which it divides on the Chalk Hills, west of Marlborough, by which parts of this canal are in the drainage of the west, the fourth, and the east seas! the Coventry canal also, by means of its Bedworth branch, crosses the grand ridge twice. The populous and remarkable town of Birmingham is situated on high ground, near to the grand ridge, and has six canals branching off in different directions, either immediately therefrom or at no great distance, and what is singular, owing to a loop, or hidden bend of the ridge at this place, no less than five of them traverse the grand ridge, either by means of tunnels or deep-cutting.

When we propose to lay before our readers a more full and methodical account than has been given of the British canals, on which large sums of money have been expended by individuals, and from which important and illing benefits have been derived by the inhabitants in their immediate vicinity and by the kingdom at large; it is needless to state any formal arguments, in answer to the mistaken objections, which were 40 years ago commonly circulated, whenever a new canal was in contemplation; such as their walling of land, producing noxious and humid vapours, destroying the breed of our draught horses, lessening the coating trade and the furniture of leasem, injuring old mines, and established works by enabling new ones to be opened, introducing pilfering workmen and boatmen into the country, &c. &c. To the more serious objections, arising from the cutting of estates and fields in two; the taking of water from mills, &c.; interfering with former navigations by canals or rivers, and even with roads, on which, in some instances, large sums have been expended, and remain not reimbursed; to these and many others, we shall have the best opportunity of replying, when we come to mention the equitable provisions which individuals have proposed, and the legislature have in so many instances enforced, for securing to every one an adequate compensation for what he is called upon to give up.

General arguments in favour of canals are superceded by the rapidly improving and thriving state of the several cities, towns, and villages, and of the agriculture also near to most of the canals of the kingdom, the immense number of mines and iron, linen, &c. and great works of every kind to which they have been conducted, and to which a large portion of them owe their rise, are their best recommendation. Justice requires our acknowledging the assistance which we have received in compiling this account, from the General History of Inland Navigation by John Phillips, from the three numbers
members which are published of John Cary’s Navigable Canals of Great Britain, from C. Smith’s, George Allen’s, and Laurie and Whittle’s maps of the canals, &c.; from J. Cary’s Large Map of England, Wales, and part of Scotland; from Robert Fulton’s Treatise on Canal Navigation, from William Chapman’s Observations on Canal Navigation, from Joseph Plough’s Agricultural Report of Shropshire, from Zach. Altis’s Confidurations on the Navigation of the Thames; from Thomas Lindeblad’s, and from Neth. Kindley’s Accounts of the Navigation of Lyon and Wifchoek, &c. from the Agricultural and Monthly Magazines, from Dr. Anderson’s Re-creations, from the Annual Register, from Thomas Telford’s Reports on the Calculated Canal, &c.; and from the writings of others, to whom we particularly refer.

To Mr. William Smith, engineer, of Buckinghain-street, London, we are indebted for many valuable hints and information given on many points, as we are also to Mr. Benjamin Brown, engineer, of Leighton Buzzard, Beds.

When it is proposed to form any canal, the choice of a skilful and experienced engineer is an object of primary con-}
embrace as many as possible of these objects, particularly coal-works; for it has been remarked, that the carriage of coals gives rise to the principal revenues of most canals; and some have even contended, that no canal can answer to the proprietors unless the carriage of coals be its principal object: there are, doubtless, some exceptions to this rule. It may be concluded, upon the whole, that no canal can be completed and brought into use, but the inhabitants and the agriculture of the district will chiefly feel great benefit from it, whatever may be the refit to the proprietors; yet in the flage of the business of which we are treating, it is the peculiar duty of the engineer to study the interest, and bring forward the probable advantages of the proprietors, fairly and without exaggeration, in order that the subscription may fill, and the work be enabled to proceed. Before determining upon the route of a canal, its connection with the neighbouring canals or river-navigations should be well considered, and the engineer should inform himself accurately of the quantity of benefit or injury likely to result to each of those exciting navigations by the effecting of the new one, or how far their rivalship, or that of any other scheme which may at the time be in agitation, is likely to affect the one he is employed upon; in all the practicable routes, which prefent themselves for the new canal.

The most eligible route for the canal being settled in the engineer's mind, he will then proceed to make a rough calculation of the quantity of goods of each different kind, which may be expected to pass upon the line in a given time; he will also examine all the canals and rivers which the proposed canal is to connect with, and ascertain the widths and depths thereof, the sizes of their locks, and of the vessels usually navigating them. The engineer will now be able, well considering the nature of the ground the canal is to pass over, to determine on the most proper dimensions for the intended canal, and whether the probable supply of water renders it practicable to effect the risings and falls by the ordinary mode of locks; or whether inclined planes, or any other of the expedients which we shall more particularly enumerate hereafter, should be adopted: or even, whether a railway, in whole or in part, may not be preferable to a canal. The mind of the engineer will properly be exercised upon these questions, before a more minute and extensive survey and planning of any particular line are entered upon; because, the line, though passing through the same tract of country, will generally require to be conducted in a very different place for great lengths together, according to the size of the proposed canal; and inclined planes, or a railway in whole or in part, will introduce a still greater diversity in the routes that ought, under the different circumstances, to be pursued.

Robert Fulton, in his 4to. Treatise on Canal Navigation, published at London in 1790; William Chapman, in his 4to. Observations on the various Systems of Canal Navigation, London, 1797; Thomas Telford, in J. Plymley's 8vo. General View of the Agriculture of Shropshire, London, 1803; Edmund Leach, Dr. James Andergon, and others in London, have recommended and enforced, upon principles more or less general and true in their application, a variety of schemes and methods of conveyance, by small canals, inclined planes, rail-ways, &c. of which we shall take notice under their proper heads, and of which the engineer will of course avail himself, as far as they appear applicable; as well as of any other inventions, which his own ingenuity or that of others may supply. Long levels may, in some instances, be obtained, without inordinate expense; and will often prove of great utility, in the saving of the time and trouble of passing locks in the neighbourhood of great towns, as in the cases of Coventry, which has the benefit of more than 74 miles of level navigation on the Coventry, Aple de la Zouch, and Oxford canals; and of Manchester, which has 74 miles of level water by Bridgewater's, and Little and Trent canals, including 32 miles in the tune to the bridge of Bridgewater's coal-works in Worsley Hill: Birmingham has 43 miles of still water, by means of the old Birmingham, the Worcester and Birmingham, the Dudley and the Stratford canals; and this upon so high a level, that the three last canals cross the grand ridge in that space: Lancaster and Preston have 42 4 miles of level on the Lancaster canal; Wolverhampton enjoys the benefit of a level 40 miles in length, on the old Birmingham, and Walsall and Ellesmere canals; Liverpool has 28 miles of level on the Leeds and Liverpool, and Blackburn, 24 miles upon the same canals; Biblethwaite has 22 miles upon the Basingstoke canal; Wirksworth 21 miles upon the Ellesmere; Devizes 28 miles upon the Kennet and Avon; Batedford 26 miles upon the Grand-bahn; London enjoys the benefit of about 19 miles of level to Paddington, upon the Grand Junction canal; Cheltenham 15 miles on the North and Clyde; Gloucester to have 18 miles upon the Gloucester and Berkeley; Shrewsbury has 15 miles on the Ellesmere; Stainton 15 miles on the Shropshire and Wellington; and Birmingham 14 miles on the Bredgwood and Abergavenny; Market Harbourn 151 miles on the Leicestershire and Northamptonshire Union; Shrewsbury 141 miles on the Shrewsbury; and Cromford 11 miles of level on the Cromford canal. Another benefit will sometimes occur from long levels, by the bringing of all, or of a considerable number of the locks near together, as at Runcorn on Bridgewater's canal, by which they are more effectually looked after and kept in repair. Should it be necessary to return the water let down by the lockage, again into the higher pound by the power of engines, as is done on the old Birmingham, the Barley, and many other canals, the having of considerable falls in one place will be of material consequence; but still more so if inclined planes are to be used instead of locks, as on the Shropshire, Shrewsbury, and Kelsall canals. In conducting the line of a canal, it will always be advisable, if other circumstances will permit, to bring two or more locks near together, and to erect a lock-house for the residence of a careful and proper person upon the spot, to look after and afford the garrisons in working the locks; where this had not been attended to upon some canals, but single locks were placed at great distances from each other, the company have, from experience of the damage such locks sustain, found it necessary to employ great numbers of lock-keepers, and often to build houses for the superintendence of single locks. Mr. Chapman, who appears to have well weighed the question, whether large or small canals ought to be adopted under different circumstances, observes, 'that the syllum of small canals is particularly eligible in all countries where lime-fore, coal, iron-ore, lead, and other ponderous articles, not liable to damage from being wet, or likely to be roten, are the objects chiefly to be attended to; and where the declivity of the country runs transversely to the course of the canal, which will generally be the case along the sides of mountains, at an elevation above the irregular ground at their feet. In those situations, the great falls or inclined planes may be made at the forks of rivers, so that the upper levels may branch up both the vales, and thus give the most extended communication. A situation fitted for those canals will often be found in countries that are not absolutely mountainous, but where the ground regularly declines towards the vales of large rivers.' The principles for which Mr. Leach has so strenuously contended, of re-
tering the usual order of beginning navigations at the lowest points or the sea, and extending them up the valleys towards the summits, and, instead thereof, beginning near the summit or source of the water, and continuing the level till the greatest practicable falls are obtained for inclined planes, would, unless the most enormous expenses were incurred for tunnels, deep-cutting, and embankments, prove too crooked and circuitous for a ready conveyance, as happened on the Bude and Launceston canal, which was proposed to pursue a terrapentine course of 8 miles, between two places whose direct distance is no more than 29 miles! The long level of the Oxford canal, at its northern end, of which we have spoken above, appears among the most crooked of those canals, which have been executed, and is particularly ill adapted, to the great thoroughfare or communication which it forms with other canals. Canals which are to form an immediate connection between the sea or tide-way at different places, as the Severn and Fort William, Grimsby, Forth and Clyde, the Life of Dogs, and the Gloucester and Berkeley, must be of large dimensions, or the principal advantages of such a communication would be unattainable; in like manner, the communications between the sea, and docks or harbours, will some of them require to be of still larger dimensions, as the Grimsby, Ulverstone, Dee new channel, &c. A system compounded of watertiers, or lengths of canal on different levels without communication by locks, may sometimes be found advisable, as on the Shropshire, Shrewsbury, Kelby, Leicester, &c. The advantages of being able to conduct a canal, in many instances, upon water-tight tracts, instead of rocky or porous soils, and perhaps without losing flight of any of the other important considerations mentioned, are sufficiently great to induce engineers to become acquainted with the arrangement and particulars of the firth within their districts, by a minute and careful examination, or to call in the assistance of those well informed on such points. We have purposely omitted, till now, to mention the consideration of the value or quality of land to be purchased for the use of the projected canal by different routes; convinced that some late canals have been materially injured by the narrow-mindedness of those who would avail themselves of cutting through common or low-priced land; even the general consideration of expense, in the works of a proposed canal, should hold but a subordinate place in the mind of an engineer in the present stage of the business, because contracted views in this respect may frustrate the attainment of a great portion of the benefits to be expected; and it cannot be doubted that any scheme of conveyance will befall answer to the adventurers and the public, when conducted upon the principles most adapted to the cafe, let the expense be what it may; and fortunately, the commercial and public spirit, aided by the means of individuals collectively in this country, has long shewn itself equal to any enterprise however bold, where advantages can be shown materially to preponderate.

In the particular survey of the line proposed, all the knowledge of the most expert and competent engineers, with the most able assistants, will be requisite. The rough section of the proposed line, before taken, will enable the engineer to see the places of the heights and breadth of the various summits, or ranges of high land that are to be passed, and whether any two or more adjacent ones can be connected by a long summit level, without deferring any considerable town or point of trade, which will diminish the difficulties of supplying the canal with water, as every such junction of summits prefers the water of two lockages, besides presenting so many more points at which the canal can be supplied with water, from springs and rivulets above its level, or where, in less favour-
It may happen, in case of a change of the direction of the valley, rendering it necessary to leave it, that some other valley may be at no great distance, into which the canal must be conveyed by a tunnel; and in order to render this practicable, it may be necessary to go back, and conduct a good deal of the line that had been done upon a new and much higher level, by omitting some of the locks, in order that the level may be continued through, and finally the proposed tunnel; in accomplishing this, the former obstacles may recur again, or new and more formidable ones may be presented. In this way, the patience, perseverance, and abilities of the engineer must be exercised, until a practicable line of some length is obtained, and flaked out; when the affiant land surveyor must follow, and make a correct and particular plan of the line of the several proposed locks, embankments, tunnels, &c., upon the same, and of the several fields or pieces of land through which it passes, or that come within ten or fifteen yards of it in any part: it will likewise be the business of the surveyor to ascertain, with the utmost care, the boundary of every parish and township, in which each of the proper names of the owners and occupiers of every piece of land in each, however small, upon or within that distance of the line, with reference to the same upon his plan; and to describe correctly all public and private roads and paths that cross or intersect the line, and to add, from what places they lead, the course of all brooks or streams of water, and particularly such as lead to, and contribute to the supply of any mill; the situation of the houses and towns upon the line, or within some miles of it, should also be determined; the nearer they are the greater accuracy will be necessary. We will now suppose the engineer proceeding with the line, from the end of a tunnel into a new valley, the course of which downwards is in the proper direction; the same process is to be repeated as was pursued in defining from the first summit, until this new valley changes its direction, or until some great town or work has been reached, and it becomes necessary to change the course of the canal, and begin to ascend some new valley or plain towards a new summit, or towards some mine or work, at which the canal is to terminate: to the new summit it will be necessary to proceed, and after setting the height of the summit level, and taking all the preparatory steps for ascertaining the supply of water, and other circumstances of this summit, as described respecting the first, the levels will be traced from this summit downwards, working backwards or up again, as often as obstacles may render it necessary, until the former work in the valley is met, and a proper junction of them contrived: the whole of this part being adjusted, the surveyor may proceed as before, with his plan and particulars; while we suppose the engineer returned to the first summit, and from which he will conduct his line, and avoid the obstacles thereon, in the best way that his ingenuity can suggest, until he arrives at the navigation or sea-port, at which his canal is to terminate, and where basins or docks, more or less capacious, according to the expected trade, and wharfs, cranks, and other conveniences, may want planning, for the accommodation of the traders and the public; all which the surveyor will proceed to survey and plan, as before mentioned. It may be necessary to remark, that every town, mine, or work, which happens to lie higher than the line, and to which a collateral cut is to be carried, must be considered as a separate summit, and provision for supplying the lockage thereof must be made, and such of the examination before described gone into, as may appear necessary; such towns, &c., as lie below the line, and are to have cuts or branches to them, will require water to be let down out of the line to supply their lockage; on which account, it is highly defirable, whenever the same is practicable, to conduct the line upon such a level, that the collateral cuts may be upon the same level, by which the trade thereon is much facilitated, and less water required.

A complete plan of the line, and all the projected collateral cuts, feeders, refervoirs, &c., being finished, the engineer will enter on a most careful revisal of the whole scheme, with this plan in his hand; on which all the places where culverts or drains will be required, are to be marked, as also the proper places for the bridges, and the necessary alterations of the roads and paths, which will be cut off by the canal, so that the public may not be inconvenienced and turned long distances round about, and still, that as few R a bridges
bridges as possible, and those in the least expensive places, may be erected. In some instances new channels will require to be cut for brooks and water-courses, to a considerable extent, in order to have culverts, or bring them to the most definable spots. For proper locating, against accidental errors, the work of the levelling should now be gone over again, and the usual bench-marks compared, and renewed with the utmost care by the engineer's assistant, while he is proceeding with the necessary inquiries and calculations, for an estimate of the whole expense of the undertaking.

In a great number of instances it will be found, that the supplying of a canal with water, occasions no inconsiderable share of the whole expense, either in the first cost of mills or streams of water, in land for, and labour in, Constructing referfors, engines to pump up water, &c.; or annually over afterwards, in the fuel for, and repairing of, engines, hire of water from mills in dry seasons, &c.; this subject should, therefore, employ the most sedulous attention of the engineer, both to make the most economical use of what streams he finds, to procure other supplies of water at the least expense, but above all, to secure an abundant sufficiency. The dimensions and height of the locks, and breadth of the canal being settled, an accurate calculation made of the quantity of water required to fill a lock; and, with the largest probable number of boats that will pass in a day, the quantity required daily to be conveyed in every part of the canal; this, with a due allowance for the evaporation, from the surface of the whole canal and its referfors, and for the loss by which will take place into the banks, however well they are constructed; will show the number of locks full of water that will be required, from all the different sources. We have spoken of the steps proper to be taken for ascertaining the whole supply that can be had above the summit's level; and it will often be necessary to make a similar investigation, on points below that level, and to construct referfors in such situations, to supply the necessary lackage, for local trade upon the line, near any great town or works, which does not extend to the summit, as also to supply the evaporation and lossage of long lengths, in situations where feeders or springs cannot be taken in the way; another use of referfors in less elevated situations may be, to compensate mills that are lower down the streams for the water that is taken for the use of the canal from the higher branches, or near the sources of such streams. For Mr. William Jeffes' observations on this subject we refer to William Pitt's General View of the Agriculture of Staffordshire, and to the Repository, vol. iii. p. 243.

There appears no reason, under the present state of things, why the owner of a mill or stream of water should not be compelled to part with the fame, for the purposes of a public canal, any more than another man to part with his field, except the accommodation which the public receive from such mill; and where the fame, or a superior accommodation, can be ensured to the public, surely this species of property ought to be put upon the same footing with land in general. See Dr. James Anderson's Essays, vol. iii. p. 68 to 70.

It ought to be considered, that the present state of our canals and inland navigations, and especially the extension of them, which we are now fupporting, remove one of the principal objections to steam engines, by enabling new mines of coal to be daily opened, and the products thereof, as well as of the old mines, to be regularly and cheaply conveyed to every situation where engines can be wanted. We would not, however, be fupposed to recommend the annihilation of water-mills; on the contrary, it hath long appeared to us, that their number and their power might, in some, and perhaps in most instances, be greatly increased, and yet all the purposes of canals be fully answered, and those most capital improvements of irrigation and drainage at the same time extended, to very large tracts of land; for this purpose it would be necessary, that an entire valley of considerable extent, that has a good stream of water through it, as the Colne, or the Lea near London, for instance, should be put under a system of improvement. A thoroughly competent engineer being employed upon such a work, would be able to conduct a canal rather of large dimensions perhaps, along one side of the valley downwards, until three or four locks, or a fall of 20 to 30 feet was obtained; and, the water in the pound below such set of locks to be a small distance below the level of the surface of the ground, in the lowest part of the valley at that place, as this would enable the whole stream of the river to be taken into the next length of level, as often as occasion should require it: this new level would be traced, until, by the fall of the valley, it has reached the sides of the hills, and proceeded with until another set of locks, three or four in number, can be obtained, and a defect made again to the level of the lowest point of the valley; this proceeds to be continued through the whole length of the valley, under improvement. The next consideration would be, a deep and efficient drain, to be carried up through the whole length of the valley, purifying the lowest ground, and the middle of the valley nearly, in such parts where the hills on each side rise equally abrupt; but where, as often happens, the descent to the valley on one side is very sudden and steep, and on the other side long and gradual; in all such cases the drain should be conducted nearer to the abrupt than to the easy side of the vale, because here the peat or alluvial matters, with which such valleys are choked up, will be found the deepest, and the springs in the gravel underneath such peat, the most copious and the most confined; the new drain ought, in general, to reach the gravel under the peat or silt and where this shall be found impracticable, large auger holes ought to be bored at short distances from each other, quite through the consolidated peat and silt, to the gravel, to let the confined springs therein at liberty. These principles of draining a hilly valley we have been successfully practised in the village of Crawley, below Woolham in Bedfordshire, by an agent of the late worthy Duke of Bedford.

If the fall in the new drain should be found very considerable, the fall must be reduced, by placing weirs or wellfalls at proper places, to let the water down in a harmless manner, which would otherwise displace the gravel and sand under the peat, and the fame would cave in, so as to fill up and destroy the drain: another excellent use of these wellfalls or weirs will be, to furnish so many points, where the whole stream, including the springs, can be taken out to supply the upper end of the levels of the canal before mentioned, or for the purposes of irrigation; as was intended and provided for, in the Crawley vale that we have been speaking of. To all the existing mills, which are not too ruinous or badly contructed to be worth improving, the channels to the water-wheels should be deepened up from the main drain, or, perhaps, in most instances, new and more direct ones cut. It will now be practicable for the engineer, in most if not in all cases, to construct an over-shot water-wheel upon the same axis that before carried an under-shot one, turning the same way and with the same velocity as before, so that the internal machinery of the mill will need no alteration, and the requisite quantity of water for working these new wheels, which in most cases will be incomparably, may be conveyed from the canal on the side of the adjoining hill, in
aqueducts or elevated troughs of no very expensive contruction, perhaps of cast iron, or in pipes, which may be conducted underground, and rise up to small reservoirs or pen-troughs above the wheel. As many of the mills will be found situated on the opposite side of the vale from the canal, it may be proper and advisable in many cases, to construct a cut or water-carriage of sufficient dimensions, and with a very slight fall, along that other side of the vale, beginning frequently at the weirs or well falls in the main drain or new brook, and pursuing the level nearly, as far as is found requisite; which cuts will much extend the benefits of irrigation, and give opportunities, perhaps, of constructing new mills, with over-shot wheels of large diameters and proportionate power, to be supplied therefrom. In like manner, several new and powerful over-shot mills may perhaps be constructed near to the several facts of locks upon the canal, without endangering the sufficiency of water for the lockage: this practice of uniting navigation and mill improvements at the same time, we were much pleased to see enforced by Mr. Thomas Telford, in his Report of 1801, printed by order of parliament, upon the intended Intersex and Port William canal, p. 46; and the same has been illustrated to the Woolverton embankment on the Grand Junction canal; see the Agricultural Magazine, vol. vii. p. 24. New and improved mills may often be constructed where the point of a hill at a great and sudden bend of the river can be tunnelled through, from the river on the upper side, as appears to have been done at Shrewsbury on the Severn, and at Stanley on the Towy rivers.

Where the new drain or brook course connects with the levels of the canal in the improvement of a valley, as above proposed, if floods are to be apprehended, or the water is ever found very thick and muddy, weirs or over-falls sufficiently large to let the flood escape down the drain must be constructed, and float-planks provided to be put down across the canal occasionally, or a lock capable of a very small fall constructed, to be occasionally used, to prevent very muddy waters from entering the canal to fill it up. It will frequently happen, that brooks which are making their way laterally into a valley under improvement, may, by an alteration of their channel for some distance up the collateral valley, be brought into the canal in places where a considerable elevation on the side of the hill has been attained, in such cases a circular weir or well-fall should be constructed in the centre of an enlarged part of the brook, before it arrives at the canal, as has been done by Mr. James Bridgwater, at the mouth of Medlock brook at Manchester, on Bridgewater's canal; a provision for float-planks, at the junction with the canal, will also be proper, to be enabled to turn occasional muddy water down the well-fall instead of into the canal. In order to preserve a sufficient elevation in the water-course, for supplying of mills, or for irrigation, after the canal has defended a set of locks, and is consequently too low for this purpose, a cut or water-carriage may be taken out of the summit's level, and carried on along the side of the hill with a proper fall, as far as may be necessary. This sylen of improvement in a valley, is capable of being combined with an extensive application of reservoirs, for equalizing the head and collateral streams which supply such valley, as recommended by Dr. W. Jelf.

In cafes where the land or park owners cannot be brought to concur in a general system of improving a valley, it would often be worth while for a canal company to obtain power from the legislature to purchase all or most of the mills in a valley, through which their canal is to pass, paying, in the first instance, the utmost value for them; and being also bound to erect the same number of mills, of equal or greater power, and adapted to the same purposes, to be supplied from higher levels in the manner we have been describing; such new mills to be offered at a fair price, to be fitted by indifferent persons, to the owners of the adjoining old mills, before the fame are disburdened in the site of the old mills, and in case of their refusal to purchase, the same to be next offered to the persons who may be tenants to the old mills (in order that they may not be thrown out of employ); and then to any other persons inclined to become purchasers, on such terms as they and the canal company could agree upon.

Sometimes it may be practicable to make a bargain for taking weekly into the canal, a stream of water which supplies a mill, only from Saturday night to Sunday night, paying a fixed rent for the same, to be secured by the act; an influence of which occurs upon the Montgomery canal.

The subject of supplying water for a canal having been amply illustrated, we shall now return to the revival of the furey, and making an estimate of the expense of the undertaking, on which we supplanted our engineer to be employed. In revising the survey of the line, it may be proper for the engineer to examine holes to be dug at certain distances, as deep as the canal will require to be cut, or deeper, to inform himself more perfectly of the soil to be cut in, and the expense attending the same, noting particularly the height to which springs may rise in the several holes. And here it may be proper to notice a very common error, into which the persons entrusted to execute canals have fallen, in such parts where springs appeared beneath the surface in the cutting, by concluding that the canal would make water, as they term it, in such parts, and that puddling was unnecessary; but where too often it has afterwards happened, that such springs, from having a variety of other vents or outlets, at or very near to the same level, and were, therefore, incapable of being dammed or raised much higher than they then appeared; when the canal has come to be filled with water to a higher level, the course of such springs has been reveral, and the porous strata through which they passed have served to absorb and discharge the water at other places, to a very fatal extent. Land-springs, or such as run only in winter, have generally the same effect, and in summer as copiously take in water, when their own source fails, as they before discharged it. The difficulty of puddling or lining out springs, on account of the powerful effort they make to force their way through the lining, as long as the canal remains empty at first, will induce a careful engineer, to examine for springs to avoid, if practicable; all springs that will not at all times rise to a higher level than the water is to stand in his canal. It will be part of the benefits of this revival of the line, to examine what can be done to straighten the canal, we mean as to sudden bends, by small lengths of deep-cutting, and others of embankment, to correct the plan accordingly, and to estimate the extra expense of all such works. The lengths and solid contents of the several embankments, and the distance from which the fluff or soil must be fetched for the same; the lengths and dimensions of all the deep-cuttings, and the distance to which the fluff must be removed; the lengths of the tunnels, and number and depths of the several shafts or tunnel-pits that will be necesssary; the lengths of headings or fooughs that will be wanted to drain the tunneling works; these, and all the great variety of other works, some of which we have already mentioned, and others that we shall have occasion to mention in the sequel, being particularly fixed, and prices affixed to each species of work and kind of material; and these prices ought by no means t.:

below the current prices of the bêt articles of the kind at the time, but due allowance should
should also be made for the advance of prices, which will take place during the execution of the work. The total probable expense, with a due allowance for contingencies, being thus obtained, the engineer will prepare his general report and estimate, to be laid, with the plan, before a meeting of the adventurers or proposed proprietors.

The next step in the progress of this business, after the appointment of a solicitor of competent legal knowledge, is an application to parliament for an act, empowering the parties concerned to complete their undertaking.

From the earliest times, the parliaments of this country have found it necessary to adopt certain funding-orders, or general rules, to be observed by the parties who applied for any act of a local or private nature; and these seem to have guided the conduct of canal projectors, till the number and variety of such applications showed the necessity of adopting, on the 7th of May 1754, thirteen special resolutions, as funding orders, relating to the introduction and passing through the house of commons, of any acts for navigable canals, or aqueducts, or for the navigation of rivers; to these another was added on the 16th June 1799, respecting intended railways and feeders to a canal or navigable; and another on the 25th June 1799, in the former order to railway or drainage, as far as the same are applicable.

The house of lords has a nearly similar set of funding orders, and one requiring a sufficient number of copies of an engraved map of the intended canal, &c. to be delivered for the use of each member of that house.

The number of clauses, relating to the construction and management of a canal, are necessity very numerous, and it were much to be wished, that the proposition of Mr. John Cennel, in several periodical works, for a general canal act, to contain all their general clauses and provisions, in the same way as the general highway and turnpike acts, and the general inclosure act, could be accomplished; it would much shorten and simplify the business of canal acts and management.

Another general measure, relating to canals, we beg here to mention, although the application to parliament for the petition just now passed (1807) did not prove successful; we mean the proposal for a general canal company, for raising a large fund, to be invested in shares of canals not yet finished, and for lending money at interest, to line canals companies as may require it, to enable them to complete and render their several concerns more generally beneficial.

Mr. William Chapman, when speaking of the navigations of America, says, (Observations, p. 64.) "It will be advantageous in a rising country, to lay out the lines of canals approximately on its first settlement; referring a proper width for them, in the original grant of the lands, with power to exchange the land of that line, for any other found more convenient, on a full investigation; and thus avoid all the difficulties attendant on those measures in England." Does not the period of the inclosure of a parish here furnish the same opportunity of considering the eligible line for a canal; and of so contriving the allotments that very few, or perhaps only one person's land may require to be cut into, upon the adoption of such measures, and that without cutting up or deranging the fytum of his or their estate? We were happy to see this idea acted upon, as far as irrigation is concerned, in the parish of Maulden, in Houghton-Regis near Dunstable, (into which a cut from the Grand Junction canal was proposed to be brought,) and in some other parishes in Bedfordshire, about the year 1797, by the late duke of Bedford's agent.

One of the first objects of a canal act is, to incorporate and make a body politic of the proprietors, by a certain name and style, by which they shall have perpetual succession and a common seal, and by which they may sue and be sued, and have power to purchase lands, to them, their successors, and assigns, for the use of the undertaking, without incurring the penalties and forfeitures of the statutes of mortmain; and to enable the company to sell any lands so purchased. The feclusion of the name for a canal, is of more consequence than would at first sight appear. Since canal and railway companies have multiplied to very much, it is necessary on all occasions to adhere to and use their incorporated or parliamentary names, a circumstance which has not been attended to sufficiently, but such a variety of names have been used, in the printed accounts of events upon or relating to our canals, that it is often impossible to avoid mistakes.

It has been usual to enable the company to raise a fixed sum of money, equal to or exceeding the total amount of expenses, by debenture or shares; and, in cases of this proving inadequate, to borrow a further fixed sum upon interest, or on mortgage of the tolls. The many and expensive acts of parliament that canal companies have been obliged to obtain in the course of their work, for powers to raise further sums, and even for regulating and enforcing the mode of raising the sums first authorized, threw the necessity of the engineer and solicitor paying great attention to this point, and to be careful to apply for powers sufficiently ample.

The usual amount of shares in canal companies is 100l. but influences of 50l. shares, and others of less or greater value, occur in several of these establishments. These circumstances ought always to be particularly attended to in comparing or quoting the prices of shares in different concerns; and we strongly recommend all future shares to be 100l. ones, especially as the legislature will permit of half shares, or even lower divisions, down to the eighth of a share, as appears in the Grand Junction act, 43 Geo. IV.

To prevent the intertis of any individuals from preponderating, and to increase the number of persons having an interest in the success of the undertaking, it has been usual to limit the number of shares which any individual can hold, under forfeiture of all above that number, except they came to him or her by will, marriage, or other legal proceeds.

The election of a committee of management, and all questions agitated in the house of commons, are disposed of by votes, not personally, but according to the number of shares held by each person, to a limited extent, and usually two half shares carry one vote. The usual limitation to prevent any individuals from possessing too great a power in the company is, that no more than 15, or sometimes 20 votes shall be given by one person; while in the Newcastle-under-Line only 6 votes are allowed; and in the Croydon, Peal, and Thames and Medway, no more than 5 votes can be given by any one proprietor.

General meetings of all the proprietors are provided for, on any important occasion, as well as annually to elect the committee and officers.

Provision should be made for progressive calls on the proprietors, by the committee, for their several subscriptions; these should be on as long notice as is eligible; but they must be prompt and strictly enforced, or the progress of the works will suffer.

The enactments relating to purchasing of lands, and ascertaining the value thereof, where the parties and the company's servants do not agree, by means of the commissioners, will be necessary, who generally confit of all the considerable land-owners of the county, or of a jury to be impunctured for such purpose, these ought to be very clear and explicit; so should the regulations and forms for selling and transferring shares in the concern.

The most ample powers should be given to enter upon, and
and dig, and construct, both the permanent and all temporary works which may be necessary; with provisions, in case of refusal, to accept the compensation offered for damage; that the commissioners or a jury shall settle the fame without delay or further appeal, except in some instances, to the next quarter-fellow of the county.

A clause is generally inserted, confining the company to the line that is laid down in the plans that have been deposited with the clerk of the peace and with the house of commons, or within certain limits on each side thereof; the usual deviation distance allowed is 100 yards; however, many instances have occurred, which are so very important as to the proprietors, that the line of the canal, and every probable cause for the necessity of deviation, should have been thoroughly examined and weighed by the engineer, and the line ultimately adjusted, before the plans are completed and delivered.

The prudent precaution of the legislature, has always limited the width of land which canal proprietors have been empowered to purchase for their canal, in ordinary cases, without the free consent of the owners; this has been 25 and 30 yards, in the greater number of instances, but in others the space allowed for the canal towing-path and fences has been less or greater, according to circumstances.

Where wharfs, docks, or basins, or places for barges to turn and pass each other, or where deep-cutting or embankments are required, it has been usual to allow 100 yards in width to be purchased; but from this allowance there have been occasional deviations.

Except in some rare and peculiar instances, like the London Docks in Wapping, the parliament will not give to any company the power of purchasing houses or other buildings, gardens, orchards, yards, parks, paddocks, or planted walks or avenues leading to any house, except the previous consent of the owners thereof be obtained; and where this has been got, it is the safest way to infer a bill of all such owners, with a description of the property they have agreed to give up, as a schedule to the bill; and the name of all material contracts for mills, streams of water, or springs, which the company may have made. Houses built, or orchards, &c. made as obstructions, since the survey was made, and notices given, will not meet with the same protection; and a clause ought to be inserted to put them upon the same footing with lands in general.

Powers should be given for erecting public wharfs, and for demanding and enforcing certain equitable rates of wharfage for goods, according to the length of their continuance on the company's premises.

The toll, or rates of tonnage, which the traders are to pay to the company per ton per mile for the liberty of navigating upon the canal, or its various branches, railway's, or inclined planes, require the most deliberate consideration, that every species of trade may pay its proportion, and none be discouraged or injured by the expences of conveyance.

In some cases provision has been made, that when the net profits of the concern exceed a certain rate per cent. the tonnage or tolls should be reduced.

There have been exemptions from toll, on several canals, in favour of officers and foldiers on their march, with their horses, arms, and baggage. Timber for the use of his majesty's navy, and government stores of all kinds sometimes pass toll free; so do gravel or other materials for the making or repair of roads in most instances. In some cases, canals have been projected principally with a view to tonnage on lime, and other manures and agricultural objects and produce; but with this exception, it has been usual to allow lime and all manures to pass, either on very low tonnage, or absolutely toll free, on the levels, and through the locks also on fees, particularly when the water actually runs over, or is within a quarter or half an inch of the top of the lock-walls; in some instances, several hours notice is required, of boats with manure or road-materials intending to pass any locks toll-free. In some instances, where a canal is to run parallel to a turnpike road, and is expected to lessen the tolls thereof, by the diminution of heavy waggons and carts, it has been usual to compensate or indemnify the creditors on such roads; and it forms equally just, where a turnpike road invites a canal, and is likely to have its tolls both ways increased, that they should not be entitled to receive materials by the canal tonnage free.

Mile-toll is generally directed to be fixed on banks of meridional canals, for regulating the distances and tonnage; in some instances, they are directed to be placed every half mile, and in others one is to be placed at the end of every quarter of a mile.

We should far exceed our due limits, if we were minutely to recount the various expectations that have been adopted for conculcating the owners of lands, parks, mills, &c. who may more or less be affected by different canals. These must depend on a variety of local and incidental circumstances, for the adjustment of which no general rules can be prescribed. But in all cases of this kind the canal companies have usually proposed, and the legislature has sanctioned, an adequate compensation. Proprietors of land and their tenants are sometimes allowed the use of the towing-path, as a drift and bridge-way between their different lands, or to some public road; the owners of the adjoining lands are often allowed to make, not only docks and basins communicating with the canal, but collateral cuts of considerable extent, for their mines and other works; but previous notice of all such intentions ought to be given to the company, that their engineer may examine the ground, and direct the necessary puddling and other precautions, to secure the line of canal from losing water to a prejudicial extent thereby.

The company are often empowered, and sometimes required, to make collateral cuts, or railway branches to particular towns, mines, or works; and a very proper precaution seems to have been adopted in the Somerset Coal canal act, that the parties to be benefited by such branches should first give the company security to make up the tolls thereof, by an annual payment, in case of their falling short of a reasonable interest on the money expended upon such branches.

In some instances it may be necessary, particularly on railways, to permit individuals to construct and manage such part of the works as pass through their own park or ground, but subject to the general system of management laid down in the act; as is done by the duke of Beaufort on the Swansea canal, and by sir Charles Morgan on the Sirhoway tram-road; also to construct particular parts, on being paid for the same, as was done by the Dee river company, at the crossing of the Ellesmere canal.

Clauses are generally inserted, requiring the canal company to remove and clamp the top soil, or vegetable mould, to the depth of nine inches, from the whole width of the intended works; which, after the same has been completed, and all the banks and excavations properly sloped down, is to be returned and spread upon them, so as to render all the land, not actually occupied by the canal and works, capable of cultivation; but a small part of this top soil is wanted in general upon the banks, and it might, more profitably for all parties, be filled by the company's men into the carts of the neighbouring farmers, to be spread upon the poorer parts of their lands.

Watering places for cattle are generally directed to be made, especially...
especially where the fields may have been deprived of their old ones by the cutting of their canal. In counties where irrigation is much practiced, as in Wilts and others, it has been common to appoint skilful and reputable persons to guard the interests of the irrigators, on the cutting of canals.

On the duke of Bridgewater's canal, irrigation trunks were laid below the bottom of the canal, so that, by means of a harrow, or rather a large hoe, drawn along, the mud of the canal was drawn to the valve or orifice of the trunk when open, and the mud was thus conveyed to the meadows below. A successful experiment was here also made, of bringing up barges laden with feaflph, or mud taken up at low water, in the Mersey, and this was gradually poured or thrown out into the canal, over the irrigation trunks while running, by which means this valuable manure was at once conveyed to and effectually spread on the meadows below. We have been greatly surprised to find irrigation so little practiced upon the lands below canals, which so perfectly admits of that improvement; were this subject properly attended to, in situations where water is plenty, we doubt not but some proprietors or lessees of land would be found, who would readily contract with the engineer, on the part of the company, before the canal is completed, to pay an annual rent for certain quantities of water, to be let out by the company's agents, at flatted times, through a trunk, which might be laid beneath, or level with the bottom of the canal for such purpose, at a very easy expense, before the water was let into the canal; and even after canals are completed, there are situations where the interest of all parties might be served, by laying trunks for irrigation; and perhaps farmers ought not, except in some few instances, to be debarred from constructing or using proper weirs at the same immovable height, or a little higher than those at the lock-gates, to take off the surplus water for irrigating during the winter season.

Sometimes it will happen that a canal can be conducted on a proper level to suit the admits to mines, as at Wordley on Bridgewater's canal, and some others; or perhaps the tunnel through a hill may be applicable to mining purposes also, as at Morwoodham down, on the Tavistock, near Ripley on the Cromford, the Harecastle tunnel on the Trent and Mersey, and others.

Coal-mines may be allowed to have the necessary passageways for their works under a canal, but should be restricted in the number, width, and height of these, as on the old Birmingham canal; or if the vicins are near the surface, the ground may be so entirely broke in, that the canal would be destroyed, as has actually happened on some of the branches of the above-mentioned canal, near to Wednesbury.

Refusing mills, it may be necessary sometimes, where the canal is to be conducted near to established mills, that they should be secured against other mills in the same line of business being erected on the canal at that place, as in the Sankey canal act. Sometimes gauge-weirs, or self-regulating sluices, may be necessary to be maintained, to supply mills or other canals with a regular and constant quantity of water; the experiments of which occur on the Rochdale canal, and at the Adelphi weir, on the Nottingham canal; the theory of the regulating sluice, in the latter place, will be found in the Gentleman's Diary, 1799, p. 43, by that eminent mathematician and coal-worker, Mr. Thomas Walker, of Bilborough; and if theorems for the widths and heights of sluices to discharge given quantities of water per day be wanted, Nichol-son's Journal, 8vo. vol. iii. p. 29 and 34. may be consulted with advantage. Those who may wish to see how the integrity of mill-owners can be exercised to secure themselves against possible injury, or even to thwart a canal scheme, may perhaps consult the Cropton canal act, for the clauses relating to the Wandle river.

Where a connection is to be made with any other canal lying upon a higher level, or even the same level, where leakage or wafF of water is to be apprehended, that would be prejudicial to either of the canals, it is usual to provide, that a lock-gate shall be erected at or near the junction, which canals may be connected so that either are discharging or receiving the water, and that a sluice is provided for curbing the afflux or ebb of water, in the lower of the two canals, as would endanger the supply or lower the level of the other; clauses for these purposes will be found in the Deane and Dove, Dudley, Stratford, Warwick and Birmingham, Dudley and Evesham, and other acts. And when any canal joins another, coming down from a hilly country, it is usual to require tall gates to be erected, with capacious weirs for preventing of floods from the upper canals making their way into the lower one, as in the Aberdon canal. It will very often happen, that tolls or dues will be to be paid by barges for entering any of the existing navigations from the new canal, or vice versa.

And where the new scheme can be supposed to interfere materially with the trade on any former one, it has not been unfrequent to guarantee that their net profits or tonnage shall not be less, after the completion of the new canal, than before; or sometimes annual payments are agreed to be made as compensation for the expected losses to older navigations; and in some instances, where the rivalry is expected to be very formidable, as on the Douglas River by the Leeds and Liverpool, and the Derwent River by the Derby canal, provision has been made, that the old concern shall be purchased by the new proprietors at a fixed sum; the settlement of the various compensations that may be necessary on a canal are often such as to require the exertion of the utmost abilities of the engineer, with the most able assistance, as the very long and complicated clauses in many acts will shew.

On applying to parliament for any considerable extension of a canal, or to raise more money, there are influences, and perhaps very proper ones, of enacting that the shares of certain discontented proprietors should be purchased out of the new funds, as on the Dudley, the Keenu and Avon, and others.

So attentive has the legislature been, even to the comfort of proprietors or inhabitants near intended canals, that it has been enacted, as on the Barnsley canal, that where steam engines were to be erected in certain places, for the use of the canal, their fire-places should be constructed, as to consume the smoke.

Ample provisioins should be made, for powers to make bye-laws for regulating the trade upon the canal, for the form and dimensions of the barges or boats to be used thereon, and for passing the locks, inclined planes, etc. that may be thereon. It is necessary to declare, that the canal is not to be subject to the interference of the general commission of lcers; manorial rights, and sheriffies in old streams, or waters ought to be reserved; and it would be well for the encouragement of the great national improvement, if the legislature would permit a canoe to stand, as in the older acts for Bridgewater's and other canals, that the proceedings and writings of the company should be void without stamps.

It has been usual to enact penalties for a variety of offences likely to be committed upon the canal, and for malicious damaging or detroying of the works to declare the offenders guilty of felony, and liable to transportation for seven years. There are many other things which will require to be taken into consideration at the period of framing the act of parliament, some of which we shall avoid repetition by mentioning, when stating what occurs to us on the practice of executing
and managing canals, to which we are now anxious to proceed.

The act of parliament for a canal being passed, and therein the time and place for the first meeting of the subscribers or proprietors thereof being fixed; one of the first business of such meeting will be the election of a general committee of management, consisting of the most independent, respectable, and generally informed persons among the proprietors. The committee of management will then proceed to elect a chairman and subordinate officers; to fix upon their place of meeting, and to arrange the order of their business.

It will not often happen that the engineer can spare himself from the projection and superintendence of other great concerns, to attend to the cutting of the canal and erection of the several works, without the assistance of a resident engineer, or more than one, if the line be of considerable length, and distant parts of it are intended to be proceeded with at the same time; and the committee will do well to leave it to their engineer to recommend all such skilled or resident engineers from among those who have been brought up or employed under him, or are well known and approved by him, for their mathematical knowledge and practical skill, experience and attention in the several kinds of works that are to be executed. The attention of the committee should be directed to fixing upon some land-surveyor and valuer of experience and great practical knowledge, who has been used to the acquisition of addresses in the negotiation and settlement of purchases and exchanges of property of different kinds; and if he has before been employed upon canals he will be much the more fit. In this stage of the business it may be well also for the committee to consider whether any local committees, or a select committee, may be necessary, to pay the more minute attention to, and to bring before them, the concerns of particular districts of the canal, and to ferre other purposes.

The body of the proprietors, assembled in a general meeting for the purpose of completing the organization of the affairs of the company, will proceed to the choice of a certain number of auditors of their accounts, and to settle the salaries of all the persons that are employed.

Most canal acts direct, that two copies of the plan of the canal and book of reference, with any amendments or alterations that may have been made in parliament, are to be certified by the signature of the speaker of the house of commons; one of which is to be lodged with the clerk of the peace for the county, and the other with the clerk to the company, who are required to produce the same, and further copies or extracts therefrom to be at any time taken by any person, and to produce the original before the committee, or any jury who may be called on to decide, any matter or dispute relating to the making or maintaining and using of the canal.

The engineer being now informed of the exact bounds within which the law has confined his operations, and of the several restrictions or alterations that may have been imposed or made since his former surveys, will, in all probability, find it necessary to look over the line and all the proposed works again, accompanied by the intended resident engineers; and, in such reviſal, it will be proper to divide the line of canal, and the several works thereof, into the necessary number of parts, and to give concise and definite names to each, that are to be used in future, in contracts and bills, &c. of which different parts or divisions a separate account of the expenses should be strictly kept by the resident engineer, the overseers, or counters as they are generally called, (that the engineer is to recommend or employ upon the works) and by the office-clerks in a ledger, with proper heads for each length of canal, set of locks, tunnel, embankment, deep-cutting, reservoir, aqueduct, or other great work, that may form a separate division: such particular and divided accounts of the works will prove of the most essential service to the committee, and to all others concerned, in informing and maturing their judgment on the actual or probable expense of every different kind of work; and will enable the committee to account to the proprietors how great, and sometimes unavoidable, as well as unexpected, expences may be incurred.

The committee should now well consider and inquire, whether any particular part of the line can be completed and opened with advantage, before the whole length can be got ready; and this being determined upon, the engineer should compare and consider, from the estimates and particulars that he possesses, the comparative length of time that every particular work upon the length intended to be first completed will require; and in this order, or with a proportionate exertion and number of men, should the several works be entered upon. Immediately after the plan has been settled, preparations should be made for providing all necessary utensils and implements.

The Act for a canal should give the company and their servants power to enter upon and occupy, for the temporary purposes of their works, heaps of foil, &c. any land except parks, orchards, and gardens, within the limited distance, on condition of their making a full and ample satisfaction, by annual rent, to the former occupier or lessee, and for all damage to the owner and occupier, to be as the works are completed, and the leas, &c. can be removed or levelled down, and covered with foil. The tunnels, cuttings, embankments, or other great works, that are first to be begun, and the levels, widths, &c. of which we suppose to be completely settled, should be marked upon the ground, with the necessary allowance of width for the tops, and the spoil-banks, which the engineer may judge right to remain the permanent property of the company.

The land-surveyor should now proceed to treat, under the direction of the committee and the engineers, with the several parties who are entitled to the land that is wanted; for this purpose, it will be right for the surveyor to prepare correct and explicit plans and admeasurments of every piece of land, and, in many instances, to deliver copies of the same to the parties; to consider well the intrinsic value of the land to the owner, and of any extrinsic or artificial value which it possesses, with ample allowance for the injury that his remaining property will sustain by being detached, or by the fields being cut into inconvenient and awkward shapes, or on any other account.

It is generally provided, in canal acts, that where any person's estate is cut in two by the canal and a part, containing less than a certain quantity, is severed from the rest, the company shall be compelled to purchase such detached part, if the party wishes it. And it ought to be provided, that the company are not to be obliged to make an occupation-bridge for less than a certain number of acres, unless the dwelling-house or farm-premises of the estate happen to stand upon such small detached part.

As soon as the surveyor has made his contracts or short agreements with the parties, containing a full description of the lands or other property to be purchased, the same will probably be put by the committee into the hands of the clerk to the company, with directions for him to enquire into the nature of the titles of the parties, and prepare conveyances accordingly, in the short and summary form that the Act ought to provide for such purpose: in like manner, where
where the parties who own the estate could not be come at, or have not been brought to agree by the surveyor, he should furnish the committee with the particulars of such property, the price offered, and other particulars of the negotiation; in order that the clerk may be directed to prepare the necessary notices for a meeting of the commissioners described in the act, or a warrant to the sheriff of the county for empaneling a jury to hear the evidence, who are to be summoned on the part of the company, and those produced by the owner of the estate, and to view and examine the premises if necessary, and to give their verdict or allowance of the sum that is to be paid by the company, and accepted by the parties.

The ground for the necessary reservoirs, to supply the part of the line that is to be begun, ought to be among the first that is marked out, including space for the head or new embankment that is to be made, and should be treated for and purchased by the surveyor, and conveyed as above mentioned. The ground wherein the locks are to be built, or any wharf or walled basons are to be made, should also be carefully ascertained by the engineer, and purchased in an early stage of the business, in order that the summer seascorn may be fully embraced, for the building of all the masonry and brick-work.

The modern acts for canals usually contain a clause, requiring all the top-foil to be removed. This, of course, will be attended to before any of the works are begun.

It has been found, from experience, that the banks of canals against which the water is to lie, ought, in general, to have their slopes so apportioned, that one foot in depth will give a horizontal base of one and a half foot; and to these or some proportions near them, rather above than below, as slopes of 3 to 1 are in general too small, will the width at top and bottom, and the depth of the intended canal probably be fixed by the engineer; and it has been found convenient and proper to make up the banks of canals one foot higher than the water is intended to stand in them.

We are now to suppose the resident engineer to be proceeding with the setting out of the canal, being furnished with a map of the several fields through which it is to pass, the line that is provisionally settled for its course, but with liberty to deviate within certain limits therefrom, and with bench-marks which the engineer has left and described at certain distances, to regulate the top-water level, or height of the water in the intended canal; and, as above observed, one foot higher will be the level of the top-bank, or height of the banks.

It will be proper for this engineer, and we shall in future, for the sake of distinction, denominate the other the principal engineer, to trace the levels accurately of each pound or level reach of the canal, and to put in level-pegs or small flakes, at every two or three chains, more or less according as the ground is more or less undulating, as he proceeds; wherever the canal is conducted along the side of a hill, as will happen in a great portion of its length, the level-pegs are not to be placed exactly along the line that the principal engineer has marked out, but either above or below that line, as the slope of the hill may occasion, exactly at that point in every place, where the level of the top-bank (traced by means of a good spirit-level, with telescopic sights) cuts or intersects the surface of the hill. In some places it will be found that the principal engineer has drawn his line across the point of a hill, so as to occasion deeper cutting than usual, to avoid going round it; or, on the contrary, crossed a vale or low place, so as to require less cutting or perhaps none at all, to avoid taking a circuit up that vale to follow the level of the ground; and if either of these deviations should be so considerable that the level-peg would fall more than two chains or thereabouts from the line, down or up the slope of the ground, the plan of having level-pegs upon the surface must be departed from, and holes should, in the first case, be dug at proper distances in the line, and pegs put into the same with their tops to the right height; or, in the second case, longer and flouter flakes should be used, particularly in the fences that are crooked by the line, or other places where they will not be liable to disturbance, and drove firm into the ground till their tops mark the right level. In tracing these levels, the engineer will refer to and compare his work with all the bench-marks before described, and at each end of a level or reach, will level up and down to the bench-marks of the reach above and below the one he has been working at, and compare the same with the fall that the locks at each place are intended to have. And we recommend particularly to the engineer to be very punctual in entering minutely in his field-book the particulars and situations of the several level-pegs, and to make one or more of the men who assist him in levelling, perfectly acquainted with the situations and distinguishing marks of them, and frequently to cause them to be looked over and renewed; or continual repetitions of considerable lengths of the work will be necessary, owing to the disturbance and loss of the pegs by the cultivation of the fields and treading of the cattle, or by the interference of idle and mischievous persons of the country. Too much caution cannot ultimately be taken, by frequent reference to the bench-marks, with due allowance for any accidental variation that may have been discovered among them, and repetitions of the levelling, to avoid those disgraceful blunders into which some loose capable and less careful engineers have fallen.

We are now to consider, that the great desideratum in canal digging is, that the fluid that is dug from one part of the work, shall, with the least labour or disturbance of moving, exactly supply or form the banks that are to be raised in another; so that on the completion of the work, no spoil-banks or heaps of useless soil shall remain, or any ground be unnecessarily rendered useless by excavations or pits. Six different cases will be found frequently to occur in the cutting or forming of a canal. (Plate I. Canal, figs. 1, 2, 3, 4, 5, and 6.) A A E L P P', being in every case, the line or surface of the ground across the canal; A B C E, in the first five cases, the bank on which the treading-path is to be made, and therefore generally the width; L I K P in figs. 1, 2, and 5, the off or smaller bank; C I is the top, F G the bottom, and C F and I G the sloping sides of the canal, in every case. The bench or berm, K I, in figs. 3 and 6, is provided to retain and prevent the looie earth that may mound down from the upper bank P K from falling into the canal. Sometimes the interference of proprietors, or other causes, may occasion the treading-path to occupy the bank, or place of the bench I K, instead of B C, which will cause a considerable difference in the calculation or measure of the fluid to be moved in figs. 4, 5, and 6, but the same do not properly form new cases. The first case occurs most frequently in cutting across or along level meadows, and we were not so well able, when treating of the first survey or projection of a canal, as we now are, to explain a limitation which ought to be attended to in all such level-cutting, especially if of any considerable length, viz. that the height or level of the canal should be so contrived, that in any cross section, as fig. 1. the sum of the areas of A B C E and L I K P shall just be equal to E F G L, the part excavated or dug. It will readily be perceived that
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occurs in fuch a work, it cannot fail of appearing, how effential a good knowledge of mathematics is to every engineer, and that none ought to be admitted to that honourable dillin&ion, who are unlearned therein, however much
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the level-peg ; fo that the ftufl" to be dug may juft form the
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need be calculated to.
The engineer will now proceed to
put in a (take oppofne to each level-peg, at the proper calculated dillancc down the flope, for the approximate or fuppofed middle line of the canal thefe ftakes will feldom be
found for any conliderable diftance together, to range in a
ftraight or in any other regular line, that will be proper for
the canal : and a very difficult and nice part of the engineer's
duty is now to be performed, in Itaking out a new line
with a taller or a quite different fet of ftakes from thofe formerly ufed, to avoid confufion ; this is called flaking the
middle range of the canal.
The requifites in this new line
or range for the centre of the canal is, that it fhould as
nearly coincide in every part with the flakes that were lafl
put in by the calculation, as poffible ; that, where, in order
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to preferve a regular and

handfome line, and avoid the aukward, inconvenient, and unmeaning crooks and bends, with
which too many of our canals, and even fome of the lateftconllruction, are

almoft in

every part difgraced, the line

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conducted higher than the calculated flakes for one or more;
ftakes together, care muft be taken that it (hall quickly be
conducted below others, fo that the redundancy in cutting
deeper into the hill in one place may be as exactly as poifible balanced by a deficiency juft by, owing to the line
being conducted below the leveUkkes.
Befides the confideration above, it will be the time now to ettimate and confider
the quantity of ftuff that will be wanted to land up every
bridge and lock, and to give extra thicknefs to the banks
on which any toll-houfes, warehoufes, or other buildings,
are to be erected, or trade carried on.
In narrow canals, or branches of that defcription, it will
be neceffary to provide for wider places at fliort intervals,
for barges to turn, and to lie in while others pafs them;
confidcrable (kill and care are requifite in the choice of proper places for fuch purpofe
they ought to be fo finite
that barge-men can mutually fee each other approaching
on
narrow canals or branches, and provide for pafiing, without
either of them having to drag their barge back again to
a
paffing-place, as too often happens
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ought to be chosen, if possible, in such hollow or low places
as will admit of widening the canal without much extra
cost. Another consideration is, the excavation of basions,
docks, or wharfs, from which fluff may accumulate, which
ought to be used up, if possible, in embanking the line just by.
Many canal companies have seen it their interest, on proper
and timely application from land-owners, who were defrains
of erecting wharfs, to direct their engineer to calculate upon,
and to excavate the additional width necessary for such pur-
pose, at the company’s expense; and this the extra or
deeper cutting that there must always be, in the approach to
a lock on the lower side, and of embanking on the same
approach on the upper side, should also be well considered and
accurately calculated; and full and explicit memorandums
ought to be entered in the engineer’s field-book at the time,
where the fluff was calculated to be had from for every
embankment, and where the fluff is to be disposed of from
every deeper cutting or extraordinary excavation. These
memorandums will prove of the most important use in the
renewal of the whole length of line or district that is about to
be fixed on in contracting for and letting of the work afterwards, by being able, without fear of mistake,
to point out which way every part of the fluff is to be
thrown or wheeled, as fast as it is dug, and that no part
of the same may want moving a second time, or any wide
or gouty places be made to disfigure the canal for finding fluff;
or, what is often of more fatal consequence, the canal being
dug deeper than usual for such purposes.

After the line shall have been thus marked out with the
utmost care, it will still be prudent for the engineer to revite
it again, and to make pretty accurate calculations of the
quantity of fluff wanting, or to spare in particular places;
in these kinds of calculations the engineer will find the most
important aid in a ready use of the slide-rule; and we beg
him to note generally that a gentleman who has long distinguish
himself by the various and important uses to which he has
made the slide-rule subservient, has prepared a short but
complete treat on its application in the concerns of an
engineer, which it is hoped that he will ere long publish.
Perhaps, on the review of the line, the curves or bends
thereof may in some cases be changed, and beauty and conve-
nience may be more fully attained without much, or even
any extra expense. The Drottwich canal has been mentioned
as one on which these points have been the most fully atten-
ted to. The portion of the canal that has been thus
flaked out and revised, may now have the boundary lines
marked out of the land to be purchased; and the surveyor
should proceed without delay to survey the same, and to
execute the purchase for the purpose, as we have before
mentioned. It will be among the first works to dig out for
the foundations of the locks, if they are not already in hand,
and for the bridges, if the season of the year and supply of
the bricks and workmen will admit of their proceeding immedi-
ately: the several drains or culverts that are to pass under
the canal should also be dug out, and prepared for the ma-
fons or bricklayers, and the several safety-gates, float-
backs, weirs, and other erections, which we shall notice
more particularly further on. It may be proper here to
caution the engineer, that in the case of pipes of any water-
works, or that supplied any gentleman’s house, croft the line
of the canal, such pipes should be laid at one, two or three feet
beneath the bottom of the intended canal, with an easy de-
cent and ascent therefrom, and the ground made good agianso as soon as possible, both to prevent their being dam-
aged in cutting the canal, and being exposed to froll, or
to thieves, if of lead, by lying bare; and in case such pipes
are found old or decayed, new ones of lead or cast iron
should by all means be laid in the deep part under the canal.
The top foil should be carefully removed; and in order to
determine readily and correctly the places of the slope-holes
at E, and L, fig. 7, and E and P, fig. 8, the engineer will
find it useful to calculate the distances of d E and d L, and
d P, by a general theorem, in terms of h b and h i, and to
make tables for the several values of the data, that are
likely to occur. The values of d P and d A, fig. 7, would
be alike useful in a table for determining the limits of the
banks that are to be raised.

Before cutting out the lock-spit, or small trench between
the several slope-holes, as a guide to the men who are to
dig, the engineer ought to cause holes to be dug in the line
of the canal, near every second or third level-peg, or oftener,
if the foil be variable, in order to prove the foil to a greater
depth by two or three feet than the cutting of the canal is
to extend; and each of these the engineer ought carefully
to inspect, in order to determine what puddling or lining
will be necessary; and what will be the difficulties of digging,
owing to the hardness of the fluff, or to water that must be
pumped out, &c., and all which circumstances, as well as the
extra distance that any part of the fluff may require to be
moved, must be well considered before the work can be let
to the contractors or bag-masters.

The puddling or lining of a canal, to make it hold water, is
a matter of the greatest importance, and we shall consider five
cases, in figs. 9, 10, 11, 12, and 13, that are likely to occur
or prevent themselves in the search, into the foil that is to
be dug, by sinking holes as above mentioned: the first case
we suppose to be that in which the whole is clay, loam, or
other water-tight stuff, as shewn by the dark shading in fig.
9: all foils that will hold water, and not let it soak or per-
culate freely through them, are called water-tight. Our
second case, fig. 10, is that in which the whole cutting will
be in sand, gravel, loose or open rock, or any other matters
that will let water easily through them, and such are called
porous foils or fluff. The third case we suppose to have a thin
stratum of water-tight fluff on the surface, shewn by the
dark shading in fig. 11, and to have porous fluff for a
considerable depth below, here distinguished by dots. The
fourth case may have porous fluff near the surface, and
water-tight fluff at the bottom of the canal, as in fig. 12. The
fifth case is that where water-tight fluff appears on the sur-
faced, as fig. 13, below this a stratum of porous fluff, but
having again water-tight fluff at no great distance below the
intended bottom of the canal. The new raised banks that
are left unshaded in all the five figures, are always to be
considered as porous fluff, as indeed they will always prove
to be, and in a great portion of foils they would ever re-
main so, unless either puddling or lining was applied; all
ground that has been dug or disturbed must also be consid-
ered as porous. It should also be remarked that any kind of
foil which is perforated much by worms or other insects,
should in canal digging be considered as porous fluff. Puddle
is not, as some have attempted to describe it, a kind of thin
earth mortar, spread on places intended to be secured, and
suffered to be quite dry before another coat of it is applied;
but it is a mass of earth reduced to a semifluid state by work-
ing and chopping it about with an spade, while water just
in the proper quantity is applied, until the mass is rendered
homogeneous, and so much condensed, that water cannot
afterwards pass through it, or but very slowly. The best
coarse sand or fine gravel in it; very strong clay is unfit for
it, on account of the great quantity of water which it will
hold, and its disposition to shrink and crack as this escapes;
vegetable mould or top-soil is very improper, on account of
the
the roots and other matters liable to decay and leave cavities in it, but more on account of the temptation that these afford to worms and moles to work into it, in search of their food: where pudding-fluff is not to be met with, containing a due mixture of sharp sand or rough small gravel stones, it is not unusual to procure such mix to the loan, to prevent moles and rats from working in it; but no loaves larger than about the size of musket bullets ought to be admitted. That the principal operation of puddling confines in confounding the mafs is, we think, evident, from the great condensation that takes place: it is not an uncommon cafe, where a ditch is dug, apparently in firm soil, that though great quantities of water are added during the operation, yet the soil that has been dug out will not more than two thirds fill up the ditch again, when properly worked as pudding. It should seem also, that pudding is rendered by that operation capable of holding a certain proportion of water with great obscurity, and that it is more fit to hold than transmit water. It is so far from true, that pudding ought to be suffered to get quite dry, that it entirely spoils when by exposure to the air it is too much dried; and many canals which have remained unfilled with water during a summer, after their puddling or lining has been done, have thereby become very leaky, owing to the cracks in the puddle-ditches and linings. One of the first cares of an engineer, when beginning to cut a canal, is to discover whether the good puddling-fluff is in plenty, and if it be not, it must be sought for and carefully wheeled out or refured wherever any is found in the digging; or perhaps procured at considerable distances from the lane, and brought to it in carts. It has happened in some floe-brach or loose rocky soils, that all the puddling-fluff for several miles of the lane, required to be brought to it; but even this exigence, serious as it may be, ought not to induce the copying of those, who have left miles of such banks without any puddling, and have made a winter canal, but which no stream of water that is to be procured can keep full in the summer months. It is usual in canal acts to insert a clause for the security of the land-owners, to require the company to cause all the banks that need it to be secured by puddling, to prevent damage to the land below by leakage; and it would have been well for all parties in many instances, if this clause had been enforced. It appears that the Dutch have been in the habit of making puddle-ditches to fence the banks of their canals from embankments, from time immemorial; and that operations similar to our puddling have been long known on the continent, but it is not clear at what period it was introduced into this country; we think that the fens of Cambridgeshire and Lincolnshire, in which so many works have at different times been executed by Dutchmen, are the most likely places in which to search for early evidence of its use. We cannot think that James Brindley was the first who ever used it in this country, although we might admit that the Bridgewater's canal was the first in which it was systematically used as at the present day. If we compare our first, fourth, and fifth cafes, fig. 9, 12, and 13, we shall find in all of them a water-tight stratum the bafis; and the practice in these cafes is to make a wall of puddle, called a pudding-ditch, or pudding-gutter, within the bank of the canal, as shewn in fection, by a, in the above figures: these pudding-gutters are usually about three feet wide, and should enter about a foot into the water-tight fluff, on which they are always to be begun: and they should be carried up as the work proceeds to the height of the top-water line, or a few inches higher. Our second and third cafes, fig. 10 and 11, evidently will not admit of the above mode, because we have here no water-tight stratum on which to begin a pudding-gutter as a bottom: in these cases, therefore, it is usual to apply a lining of puddle to the sides and bottom of the canal, as shown by the cross-sectioning in figs. 10 and 11: the process of puddling and lining will occur more properly further on, as we proceed in describing the operations of digging and forming the canal.

In order to describe more intelligibly the process of setting out and digging a canal, in the two cafes where puddling or lining will be requisite, we have repeated our first and second cafes, but on a larger scale, in figs. 14 and 15; wherein p is intended to represent the hole that has been before supposed to be sunk, in order to prove the soil; and, according as this terminates in water-tight or porous fluff at the bottom, that puddle-ditches, q, r, and s, &c. in fig. 14, are laid in the manner of H G F D. fig. 15, is to be applied; D H being the height to which the water is to be raised in the canal. The engineer will in the first cafe determine the places of E and L on the ground, and dig small holes or mafs to mark the fame, called slope-holes; but in the second cafe other marks must be made at n and w about five feet from the former, to direct the beginning of the cuttings, with allowance for the lining. A skilful and very handy workman is now required to mark out the line upon the ground, called the lock-spit, between the slope-holes at E, fig. 14, above-mentioned, which we have supposed to be made at about two or three chains from each other. This is done by laying down and stretching a strong line upon the ground, between two or more adjoining slope-holes, and if the canal is not to be straight in that part, with small pegs to give it the gradual and regular bend in every part that the canal is to have; the workman then proceeds, holding his spade or grafting tool over the spit, as the same is laid, so as to guide himself by the fluvet of E, that the bank of the canal is to have, and strikes it successively into the ground close to his line, until the whole length of the line is marked out; by this means, if the ground has sudden undulations, or hollows, as continually happens, owing to the ridges and furrows of cultivated lands, and other causes, yet a regular line coinciding in every part with E is marked out upon the surface; before the line is taken up, another labourer follows on the other side of it, and strikes in his tool inclining the contrary way, by which a more regular bit of piece of earth is cut and thrown out; a similar lock-spit must be cut on the other side of the canal at L; and the same at n and w in fig. 15. If wettines and regularity are properly consulted, lock-spits for the extremities of the banks at A and P will also be proper, especially if the land A and P is valuable, and the damage by the scattering and laying of the fluff would be considerable. The engineer has now to determine, in fig. 14, the points c and d for the beginning of the puddle-ditches, and thence he ought to chafe such, that if the same were carried upright to the top-bank, k c or i a would be about one foot: if this is not strictly attended to, the labourers or navigators, as they are called, will for their own convenience begin their puddle-ditch much too near the canal at E and L in some cafes, and not make it upright but hatching back to arrive at a b; and puddle-ditches so made are apt, owing to the settling of the bank, to get broken and be spoiled. It may be proper here to remark, that canals set out with the scientific precautions and care that we have recommended, will always have the proper quantity of fluff to allow for the settlement of the banks, because A B C E + L K P = E F G L, in the same settled or consolidated state, that the latter part was before the digging commenced: it will, however, be proper to give the contractors a table or rule flowing, according to the height, as a, what extra height a suddenly raised bank is required to be, to allow for settling: and it is evident that the
the slopes of such banks must be fleeper in the first instance, than they are intended ultimately to be.

We may now suppose the engineer to proceed to the letting of the cutting of certain lengths of the canal to contractors or bag-makers, who will employ a number of navigators under them, in digging and puddling the canal. It is usual to let the work at a certain price per cubic yard of digging, and to pay for the puddling and lining either at a certain price per cubic yard, or per yard run of the canal. This engineer ought to inform himself thoroughly on the difficulties and facilities which attend the work he is about to let, and to draw up a short but explicit contract to be signed by the contractor. We cannot but recommend that all contracts for material or large jobs of work, not only in cutting, but for the masons', and other works in particular, should be submitted to the principal engineer for his approbation, before they are signed or finally concluded on. The prices allowed ought to be fair and liberal, according to the circumstances, so that the contractor may have no pretence on account of low prices, to slight his work, particularly the puddling; and they ought in every instance to be strictly looked after, and made to undo and renew immediately, any work that shall be found improperly performed. We recommend it to the engineer to keep a strict account, by means of his overseers or counters, of all the men's time that are employed upon the works; distinguishing particularly the number upon each work, and whether employed by the day, under the company, or upon the work that is let to contractors. These particulars are most essential towards knowing, what money ought to be advanced to the contractor during the progress of his job, and towards informing and maturing the judgment of the engineer, in the length of time that a certain number of men will he in performing any future work that he may have to direct; and a calculation ought to be made in every instance of the day-work, and compared with the contract price, by which alone a correct judgment can be formed of the proper prices at which work ought afterwards to be let, so that the labourers may receive proper wages, proportionate to their exertions, and the contractor be amply paid for his time, skill, and superintendence; and yet economy and the interest of the company be duly consulted. Barrows and wheeled-planks, forking-blocks, and other implements, are generally found by the company, and it is usual to consider 20 to 25 yards, to be a flag of wheeling, and a price per cubic yard to be fixed, according to the number of fages that foil is to be moved; where this distance exceeds 100 yards, it will not often be able to perform it by wheel-barrows; and runs of planks with an easy descent, if the ground is practicable, should be then laid for large two-wheeled barrows, or trucks to be used thereon.

The cutting of a canal being let, the work is usually commenced by a labourer, on the part E, fig. 14 or 15, on the lower side of the canal; and from the lock-fret at E he marks out a certain width to g, such that he can throw the clay as he digs it, to the part A, and so that the heap may not obstruct the intended puddle-gutter cd. The side E F he is careful to cut down in the proper slope of the bank; the other side is usually cut straight down, and this work is continued until he comes to the bottom of the intended canal at F A, and this space E F b g is called the "reaching." The same process is followed on the lower side of parts that want lining, as fig. 15, except that n r b k g is the reaching in this case, and that there is no necessity to throw the clay further in this case, than that it may lie upon A without rolling back into the work; and it is usual, if the reaching will not be very deep, to lay two or three rows of soil; or found spots of earth, with regularity in the face of the slope n g to form part of the bank, and to throw the other stuff over these. Reachings are also to be dug on the upper side of the canal, as i k G L, or at least as much stuff is to be thrown out therefrom as can conveniently be flowed upon d P and e P, figs. 14 and 15.

It is now time to commence the puddling in fig. 14, and a labourer begins by digging out the bottom of the intended puddle-ditch c e d; if the soil dug out is good puddling-stuff, he lays it on the part d E, if otherwise he throws it at once on to the heap on A c. A careful examination of the face E F of the reaching will show to what depth the puddle-ditch d f ought to be carried in every part, to reach and intersect any faulty places, or veins of lighter foil, or worm, rot, or mole-holes that may accidentally occur in the bank. After the puddle-ditch is dug clean out to its p o per depth, and this is a circumstance that the engineer or some careful overseer ought always to look particularly to, about 9 to 10 inches thereof is to be filled lothly up with puddling-stuff, either from that which comes out, or from the nearest heap in reserve, all large stones, slacks, flaws, or other external matters being carefully picked out of the stuff as it is sprinkled in: by this time, unless the season is very dry, it is probable that some water will be collected in the bottom of the reaching F A, and this should be laded out with a sump into the puddle-ditch, so as to give the stuff therein a good wetting; if the puddling-stuff be of the flatter kind, or was very dry, it will be right for the labourer to take himself to some other part of the work for two or three hours, but perhaps giving his stuff another sprinkling of water in the interim; he may then proceed with the puddling; and for this purpose he ought to be provided with a stout pair of puddling-boots, that will keep out water; he begins at one end of the trench, and keeps chopping with his tool into the stuff and quite through it, giving his tool a luning motion every time before it is withdrawn, so as to let the water run down and into every part of the puddling-stuff; if more water is wanted, another labourer is set to lafe it out of the reaching as before; and the puddler thus proceeds, chopping down at every inch or thereabouts as he slowly advances, and rambling about at the same time as much as he can with his feet, which greatly affiis the operation: when arrived at the end of the trench, he returns and repeats the same operation, until every part of the puddle is properly worked; which is known by the tool going equally easy into it in every part, which it would not do if any dry lumps remained, and the whole being in a semifluid state; giving the puddling-stuff just the due quantity of water is very essential to its working well, and this, experience will soon point out.

Very great care and management will, in general, be required on the part of the engineer, to furnish water for the puddling: it will often require to be brought in temporary trenches, perhaps across several fields from some mill-dam, large pond, or spring of water above the canal; for which purpose general powers ought to be given in the act, upon condition of levelling and making all such trenches good again as soon as possible, and paying for the damage; often times puddling water is not to be had without pummpering it up, and conveying it considerable distances in troughs, of which great numbers will be required. It will very often be requisite to convey the water across the canal in troughs to the different puddle gutters, and plenty of treffles should be in readiness for supporting these troughs at the requisite heights. Considerable care will be necessary to turn off the surplus water, into some channel where it can run off without flooding the works; or to stop it at its source; this last ought always to be adopted, when the supply is not very plentiful,
plentiful, or the owner of the stream or pond might be injured by taking a constant stream from him, during the progress of the work. The first or bottom course of puddle being properly worked as above, it should then be suffered to stand two or three days undisturbed, and without any more water being given to it; when it will be found sufficiently set that a man may step on it without sinking in; it is then ready to receive a second course; the first step is to scrape off and remove any lumps of earth, stones, and other matter which may have fallen into the puddle-ditch; about 10 inches thick of pudding-fluff is then to be sprinkled lightly into the ditch as before; and water is to be applied either from the reaching, or from some of the troughs which we have been mentioning; some hours time is to be allowed for the fluff to soak, unless it be light loam, and moil at the time of putting it into the ditch; in such case, the puddling may be begun almost immediately: care must be taken that the tool be made to penetrate a small distance into the old puddle at every chop, in order that the two courses or layers may be properly incorporated. After this course is properly wetted and worked, it must stand the proper time to set as before, but by no means to get dry, otherwise it will be found full of cracks and must be worked anew: and in cafe, owing to any temporary suspension of the work, it should be necessary to leave a puddle-ditch before it is finished, it ought always to be covered, and left with a dry or unworked course of pudding-fluff upon it, to keep the air from it, and preserve the proper moisture in it.

When a sufficient number of courses of puddle have been added, to fill up the ditch c e f d, two or three rows or courses of sods, or spots of earth, must be laid on each side, to raise the ditch so much higher; at the same time that the heap of fluff on A e is levelled down, and other fluff is brought by the men, who are wheeling from the bulk g b k i that is left in the middle of the canal, and laid on d E to back up the spots or sods; after cleaning the surface of the puddle, if properly set, it will be ready to receive another course of pudding-fluff, the water must be turned on, it must have time to soak, if necessary, and then be worked and flanked to set as before; other rows of spots or earth may then be laid, to raise the sides of the puddle-ditch, and the bank may be made up to the same height by fresh fluff wheeled in from the canal; and care being taken to lay spots of earth to form the slopes A B, and E C, as the works proceed upwards, particularly the inside slope C E, which should be well trod and consolidated by strokes of the tool to prevent its falling down, or being disturbed by the water when the canal is filled; another course of pudding-fluff is then to be added, and all the same processes gone through till the puddle has arrived at q w, the height of top-water, or an inch or two higher, which being properly set, the bank is to be made up, covering the puddle completely up with common fluff, to the intended height of the top-bank. B C, with proper allowance for the settling; and observing that the puddle will not settle near so much as the other fluff, if at all. The processes is no way different, by which the other bank L I K P, and its puddle-ditch, are to be carried up, and completed to the intended height. The part of the canal, with puddle-gutters, fig. 14, of which we have been speaking, has, in general, a lump or ridge of fluff remaining in the middle of its bottom, until the very last, a different system of which, however, to be purified with such parts, fig. 15, as require to be lined; here the banks A B g n, and g v K P may be at once made up, and the whole of the space n r s v ought to be cleared for certain distances, before the lining of the bottom can be begun. A great deal of management is required by the overseer or contractor, to manage all these parts of their business, so that there is no hindrance of any part of the work, that every man is provided with fluff by the wheelers, when he wants it to make up his banks, or puddle, and that the parts to be lined are cleared in time.

To accomplish all these objects, a good part of the fluff cannot be wheeled directly out to the near or opposite points of the bank, but it must be worked forwards and backwards obliquely, on the runs of wheeling planks by the wheelers, as occasion may require. It may often be necessary to exceed one or two, or perhaps more, stages of wheeling, to avoid taking out the fluff and channelling it, by which it would require filling again, damage would, in most cases, be incurred on the adjoining lands, and frequently the puddling and working of the banks would be impeded, by clogging them to land the fluff.

A length of the canal that is to be fixed being cleared, and the bottom levelled and cleaned smooth down to the line r z, a course of pudding-fluff about 10 or 12 inches in thickness is to be spread over it, with all the precautions, to extract extraneous and hurtful matters, which have been before given, and the whole is to be wetted and allowed to soak if necessary, as before: the working of this puddle is now to be begun; and as the extent will generally be large, several men may be employed, at once, upon it, so as to make it work while for an overseer employed by the company, to attend them constantly to see that no part of the work is lighted: as the bottom in this case is filled up to be sand, loose rube of a rock, chalk, or other matters, that would injure the puddle if mixed therewith, we have recommended a thicker course at first than is usual of puddling-fluff, and in working the same the men ought not to strike their tools deeper or even quite so deep as the bottom of the pudding-fluff to avoid disturbing the bottom. When this course of puddle has been added to, another course of about nine inches is to be added, and treated as before, till about three feet of puddle is added, if the soil is very porous; and the top course being set, a course 18 inches or two feet thick of the common foil or fluff should be laid evenly upon it and the bottom levelled; this covering of the bottom should be rather dry, and not in large heaps, or with great flanks or licks in it.

The lining of the sides is now to be proceeded with as follows; the top covering of the bottom should be removed for three feet in width next each of the sloping banks; and the surface of the puddle be carefully cleared of dry lumps, stones, &c.; a thickness of nine inches of good puddling-fluff is now to be laid in this place and wetted and worked, and allowed to set as before directed, when another nine inches is to be added in like manner; some common fluff from the digging of the canal is then to be brought in spots or sods, and carefully piled up for two feet in width, and about nine inches in height, hatching-back before and behind, agreeable to the slopes F E and G I, and leaving a space or puddle-ditch behind, next to the sides r n, and s v; the surface of the puddle at the bottom of these is to be carefully cleared, nine inches of puddling-fluff applied, wetted, worked, and allowed to set as before: more spots or sods are then to be piled in the front, as a facing to keep up the puddle, and their interlites should be filled with fine fluff to make the whole solid; when puddling-fluff is again to be applied behind, and the same process repeated till the puddle and facing arrive at q D and H G, when the remainder is to be made up with dry fluff and spots to the top-bank level at C and I, as directed in the former case.

The last of these ways of making a canal water-tight is the more tedious and expensive of the two; it is however general, and may be applied in any situation with perfect success.
success. Mr. Thomas Telford, in Plynley's Agricultural Report of Shropshire, 8vo. p. 295, when speaking of the Shropshire canal, says, "This canal, carried over high and rugged ground, along banks of swelling loam, over old coal-mines, and over where coal-mines and iron-flume are now actually worked under it, is a satisfactory proof that there is scarcely any ground so difficult but where, with proper exertions and care, a convenient water conveyance may always be obtained." And we have heard of instances of canals being conducted over ground so rocky, and abounding with such great chasms, and loose pieces of rock, that many yards together of the canal bottom might have fallen in, had not the precaution been first taken, of removing all the smaller and loose flats of rock, and thorough wedging in the large loose pieces of rock with flumes, set in mortar, and then rendering the foundation found, on which to fill up the inequalities, and a lining and facing was applied as above, with perfect success. We have already observed, that some persons have thought it right to omit puddling or lining, where springs appeared in the bank of a canal; and the matter is of so much consequence, that we beg farther to observe, that the appearance or non-appearance of springs ought in general to have no effect in determining the propriety of these essential measures; if a spring is of any use to a canal it will rite, owing to the puddle-ditch or lining, and run over the same into the canal, and no water will be thereby lost; and if it will not so rite, it may safely be ranked as a drain of the most mischievous kind, instead of a supply, and therefore very essential to be stopped up.

In case it is found that there is fluff to spare after completing the banks, it will sometimes be advisable to remove the top-foil from A A in low places, and after spreading the extra fluff so as to make the ground good, to return and spread the soil upon it: the part P P will often admit of similar treatment, and sometimes sudden hollows there may be filled up, so as to have a fall to the top-bank 1 K, and avoid a deep ditch through an adjoining swell or rise of the ground at P, to carry off the rain water to a culvert where it is to pass under the canal: where it happens that P P is waste or ground of little value, or the company is possessed of a piece of land that has been obliged to purchase and cannot readily dispose of, it may be proper to make a heap or spoil-bank of any extra-fluff, to be afterwards boiled away as occasion may require. If a deficiency of fluff is experienced to complete the banks, the part P P furnishes a good resource in many instances; the top foil being removed on the higher parts, an excavation like P y P', fig. 14 and 15, may, and indeed must in many instances, be made with a proper fall for conveying the rain-water that falls in every part above the canal to the brook or culvert that is to take it off; the slope P y ought to be so easy, and the top-foil so spread, that the land shall be as fit for agricultural purposes afterwards as before. Another resource ought in an earlier stage of the business to be provided, in the deep-cutting, by marking out a yard or two or more width of ground to be purchased on the upper or deeper side, than is actually wanted, by which a great deal of fluff may be procured at a comparatively small expense of land: it must be evident, that the resources we have pointed out above are inadequate to receive any great redundancy, or to supply any great deficiencies of fluff, and are only sufficient where the canal has been cut out with scrupulous care; bungling, or careless canal-makers must be content to leave laching marks of their incapacity or folly behind them, in the many fudden bends into the hill that they are obliged to make to obtain fluff, and out of it to dispose of the fame in other places, with numerous wider or deeper places on the canal to make up the banks, or in enormous spoil-banks or useless excavations. Where a reserve of fluff has been made in the deep-cuttings at several points on each level or reach of a canal, as above-mentioned, it will be the better fault of the two, to experience a deficiency of fluff; because as soon as the bottom of the canal has been cleared, and the lining of the bottom and sides for some height performed, or the puddle-ditches carried up, the canal may have 18 inches or 2 feet of water let into it, and dirt-boats may be used to carry fluff from the deep cuttings to make up the banks in other places; whereas all redundant or spare fluff must be got out before the bottom lining can be applied, or any effectual use made of boats to move fluff from place to place; and the same advantages will be experienced in situations where puddling-fluff is only to be procured at particular points on the line, by clearing out and completing the bottom part of the canal for considerable lengths, so that dirt-boats may be used to bring the fame for the puddling or lining of the upper part of the banks, which, if there is spare fluff, cannot be effected without heavy expences in moving the fame and forming spoil-banks. Where the line of a canal is to cross an extensive flatum of valuable brick earth, or one of good gravel for making of roads, it will often be advisable, especially if the line can be rendered more direct thereby, when setting out the canal, to cut pretty deep into such materials, and even quite through the gravel, if the same is practicable, as might have been done at Dawley-deep, between Paddington and Uxbridge, on the Grand Junction canal; for although considerable expense will in the first instance be incurred in digging and in damage for spoil-banks, yet such materials, as good brick-earth and gravel, will in almost every instance find a market as soon as the canal is opened; such a situation of the canal may prove of essential service to its trade, by enabling the adjoining proprietors to work the whole thickness of their brick-earth, gravel, or other useful matters, and destroy but very little of the surface of the ground, and without being annoyed by water, but which the canal would catch in very considerable quantities perhaps, instead of losing water by preferring a high level through porous fluff. It is highly to the interest of a canal-company to give facility to the getting and conveyance of all useful articles within their district, at the cheapest possible rates, as the only means of opening new sources of trade or manufactures, by which their concern will be in the most essential degree benefited. In districts where flume and gravel for making and repairing of roads are scarce, it will be proper to pay the labourers certain rates per cubic yard for all the flumes or gravel that they may collect out during the work, and stack in proper places; as refoures for the making of the towing-path C F, fig. 15, and for making good the landing or alcent to the several bridges, and the several pieces of new road that the engineer will have to form, near to the canal and bridges; the lock-banks and all wharfs and landing places should also be covered with good gravel to render them safe and convenient for use; if good gravel can in places be interlaced in deep-cuttings, much of the above expense, as well as of cartage, may be saved, by an early use of dirt-boats in the bottom of the canal. It cannot, we think, have failed to strike every reader ere this, how very important and various the duties of the resident engineer are; but the same will be much more apparent, when we shall have finished, in the following pages, the more particular observations that occur to us under the heads of refoures, feeders, aqueducts, embankments, culverts, safety-gates, weirs, tunnels, deep-cuttings, locks, substitutes for locks, inclined planes, rail-ways, bridges, towing-paths, fences, drains, boats, towing or moving.
ing hats and teams, cranes and implements, &c. of which we
shall proceed to treat; after observing, that none but men of
the strictest integrity and extensive knowledge ought to be
employed as competent engineers, and that the committee and
principal engineer ought not to hesitate in offering and pay-
ing such men a very liberal salary, to engage the whole of
their time; and, that too great a length of line or extent of
business should not be put upon such a man. This is the
proper sphere, where young men or others, of knowledge and
practising industry, who are coming forwards in their pro-
fession, should exercise and give specimens of their abili-
ties as engineers; and it will prove of the utmost importance
to such, as well as to a company who have an extensive line
of canal to construct, to employ more than one of such men
at the same time, upon adjoining lengths of the canal; where
their emulation may be excited in an honourable contest, as
to those who shall execute their portion of business in the
most complete, orderly, and economical manner.

One of the first considerations relating to the cons truc-
tion of a Reservoir for supplying a canal, is the supply of water that
is to be expected for it, and in what proportions at different
times of the year: for this purpose we suppose the engineer
to be furnished with an accurate survey of the vale or vales that
lie above the intended reservoir, so as to be able to calculate
exactly, how many square miles and fractions of surface
will drain towards or want their rain-water through the part in-
tended to be embanked for the reservoir; it will be very
proper also to be furnished, if possible, with the exact gauge
or quantity of water that has actually in former years been
discharged by the brook or stream that is to be embanked;
as also with the quantity or depth of rain which usually
falls within the drainage of the intended reservoir. If the
length of time that has elapsed, since the situation of the
reservoir has been determined on, has not allowed of careful
and accurate experiments being made on these points, the
engineer must assume them from the best data that the infor-
mation of millers and other persons will afford, and the
printed tables, or journals of rain, kept by curious persons
in the nearest familiar situations, must be consulted: it is par-
cularly necessary to attend to this last circumstance, because
there are, we believe, instances of places where the annual
depth of rain does not amount to a foot, and others in which it
exceeds five feet; while 25 inches is about the medium
depth of rain annually, at or near London. The most perftc
method of obtaining true information on this subject, is to
gauge the different springs or streams, from whence the sup-
plies of water are to be derived, and thus to ascertain the exact
furrows, after the mills are amply furnished. In the great
contests about the Rochdale canal, Mr. Rennie had all the
streams, which could be affected by the proposed reservoirs,
gauged for about a year. He first ascertained the rate of
these streams at a time when the mills were amply supplied
with water, and had proper gauges fixed upon them. The
daily difference was measured, and the furrows thus ascer-
tained amounted in the year 1793 to fifteen times the
ordinary produce of the river. The evaporation that
takes place, from a given surface of water in different places,
hast not yet been so accurately observed as the importance of
the subject to canal engineers deserves: Mr. Bevan's obser-
ations thereon, at Leighton-Buzard in Bedfordshire, con-
tinued for five years, to the end of 1804, gave an evaporation
of 25.92 inches at a medium per annum, while the depth of
rain there, in the same period, was observed to average 23.25
inches; in some years the evaporation considerably exceeded
the depth of rain, and in others it fell as much short of it or
more. On this subject, see the article Evaporation.

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It will sometimes happen, that the valley in which the
reservoir is to be made, has other vales parallel to it, or
one or both of its sides, such, that by beginning a short
or small tunnel above the level of the reservoir, continuing
it with a small rive through the adjoining hill, and from
this further end continuing a ditch or feeder along the side of
the hill rising gently as it proceeds till it intersects the bot-
ttom of the vale, a brook or considerable stream of water
may at times be thereto added, and brought into the res-
ervoir; or, another case may happen, in which the adjoin-
ing vales instead of being parallel to, proceed directly
from the reservoir valley, and yet feeders may be let out,
so as to collect great quantities of rain and spring water,
from the sides of the hills that slope towards the adjoining
valleys, and through which it would otherwise escape. Both
these methods are found successfully practised about the year
1769, for increasing the supply to the new water meadows
which the late Duke of Bedford had directed his agent to
construct near Woburn. A parallel valley, which crosses the
turnpike road at about 4½ miles from London, has its
stream of water diverted at that point, and through a short
tunnel into the Woburn vale, which it otherwise would not
have reached for a mile or more, and at a much lower level.
From the lowest point in the ridge of high land that sepa-
rates the Woburn vale from one that proceeds through
Postgrave parish towards Leighton, a trench or feeder was
begun, and carried for a mile or more along the side of the
hill in Postgrave, by which the rain water of 3 or 400 acres
of land was brought into a reservoir in a branch of the WO-
burn vale, to be reserved for use.

The engineer, who has well considered and ascertained
all the circumstances of the vales in or near to which his
reservoir is to be constructed, will be able, by help of a num-
er of levels, carried round to where the surface of the wa-
ter will extend at every 5, 10, 15, &c. feet in depth, or
often, if the nature of the ground requires it, to calculate
to what height the head of the intended reservoir must be
embanked to retain all the water that his valles can supply,
between the times that it is fed by rains and springs, and
required to be let off to the canal or mills, or such quanti-
ty only as it may be necessary to retain, according to the
principles before laid down.

The necessary height of the head or embankment for a
reservoir being determined, the next step will be to examine
minutely the nature of the flata and soil that are to be cov-
ered with water, and whether the whole or any part of the
same is so porous as to require lining with puddle, as also
the nature of the stuff which is to be used in forming the
head or bank, as thereon will depend, in a great measure, the
degree of slope which the banks ought to have; 15 to 2 feet
above one to height feems the usual slope; but if the soil
should prove a flippy clay, as at the Aldenham reservoir,
belonging to the Grand Junction canal, a greater fl- pe
should be given, as well as the precaution taken, of putting
in frequent layers of sand or coarse gravel, to lessen the ten-
dency of such soil to slip. If the reservoir will require bot-
tom lining, yet fill it will not sometimes be right to trust to
lining for the head of the reservoir, but to carry up a puddle-
ditch in the centre of the head, because if the inside of the
head should happen to slip, the lining would be broken and
disturbed. The ditches being intersected, it will be right to make
a cross section of the valley at the place of the centre of
the head, as A C B (Plate I. Canals, fig. 16.) and to determine
by levelling, and mark out the places of, as many perpen-
diculars or equidistant ordinates a, b, c, &c. as the width of
the head and the nature of the sides of the hills A C and

T
CB may require; we are next to consider, that the section of the intended bank at every one of the points a, b, c, &c. will be nearly triangular, as DGF, fig. 17. (except wanting a small triangle GHI at top) KE being equal to the ordinates a, b, c, &c. in every case; the base DF, or width of the head at the different places, varying according to the height KE, and according to the inclination or fall of the ground DF, compared with the horizontal lines FL and IH. A theorem for ED and EF will readily be obtained with the above data, and these distances being calculated and laid off on the ground, so many points for the bottom of the flops will be determined, and a careful workman will find no difficulty, by pegging down his line and holding his drafting-tool in the inclining position HD and IF, (as before mentioned reflecting marking out the canal) to mark out a lock-fpit, as a boundary or base for the intended embankment.

If the several triangular sections DGF are taken near enough to each other, A a, b, c, &c. and are carefully calculated (for whatever purpose in very large works, tables framed from the theorem will be found the readiest way), by deducting a triangular prism, whose base is HGI, and length A B, figs. 16 and 17; the solid contents of the required bank will be very exactly obtained; and the most eligible spots for obtaining that quantity of fluid, as near as may be, without endangering the stability of the bank, may be indicated; and the work will then be in a state to be let to the contractors who are to execute it. But before this is begun, it will be necessary to provide for the escape of the surplus water when the reservoir shall be full, as also for letting out the water for use; for these purposes an arch of brick-work, or of stone, may be begun at the lower limit of the bank in the lowest ground or brook course, as at D, in fig. 18, and continuing the same on a level to a point M, some distance within the head DHE of the reservoir; D'L' being the lowest ground or longitudinal section of the valley. This arch should be high enough for a plank to be supported and fixed on iron or bearsers across it, about a foot from its bottom, on which a man can conveniently walk along; and, for this purpose, the arch had better be made elliptical, or higher than it is wide; a secure iron gate should also be provided, to be kept locked at a few yards into the arch from D, for excluding improper persons. At the termination of the level arch at M, there should be a circular well of 6 or 8 feet diameter more or less, according to the greatness of the floods that may be expected, to be sunk 6 or 7 feet deeper than the arch DM; its bottom should be formed either of one very large flat stone, or of a few well jointed ones laid on a course of pudding, and on this the fining of the well should be begun, with bricks of the very best quality, well keyed up and embedded in cement; and, having a course of pudding of 9 inches or a foot thick, worked all round behind them, allowing the same to set as the work advances in height; this well, and the arch D M, are to be firmly groined into each other at M; near to this groin, or within reach of a man standing on the end of the plank above mentioned, which should not advance quite up to the well, should be a large brass cock worked into the walling; the mouth of this cock should be turned down, so as to discharge its stream of water exactly in the direction for the centre of the bottom of the well; and from this cock should proceed a large pipe of lead or cast iron behind the wall of the well at some distance, for which purpose it will require a considerable bend, and this pipe should proceed, soundly embedded in good pudding, towards a convenient place as S, in the bottom of the reservoir, where it should terminate under a large and stout box full of holes, or a fine grating, to prevent the entrance of silt or any thing that might choke the pipe or cock. In constructing the arch before mentioned, after it has proceeded from D as far as the intended puddle-ditch ed; the puddle-ditch should be dug out for some distance on each side across the arch; the same should be continued down to water-tight fluit, or at least for some depth into other matter, if unfortunately such is not within reach; and, when the puddle is carried up and set, as also a course of pudding in the bottom of the arch course d M, which should have been dug deeper for such purpose; the bottom of the remainder d M of the arch should be carefully laid on the puddle, and a centering for the arch is to be laid on the same and firmly secured down; this precaution being necessary to prevent the fluid puddle that is to be applied successively without the arch, as it is carried up, from floating or burying up the centering along with the lower part of the arch. The work is thus to proceed until the part of the arch d M is completed, and inclosed completely in a cafe of good puddle, thoroughly and completely joined at one end into the puddle-ditch a e f b, and into the puddle that surrounds the well N M at the other. When the well-finishing has been carried up to the M, it will be necessary to increase the thickness of the pudding-wall round it, to three feet or more, taking care that the extra work is firmly built upon undisturbed and solid earth. The well is intended to be carried up in the same manner, surrounded by puddle, and by a conical embankment of earth of O P Q R, to within two feet of the height of the bank HI, leaving a channel of several yards wide, and of considerable depth, 1 O P, between it and the bank or head D H I E. It will be necessary for the engineer to calculate and mark out the base of this conical embankment upon the ground, with allowance for ample flops to prevent slipping; or its washing down by the waves: it will also be proper, for ensuring stability to the work, to reduce the whole of the top of the work to one level as K L, as soon as can be, by successive layers of fluit thereon, and of puddle in the ditch a e f b, and round the well N M; and, if the bottom of the reservoir will require lining, owing to the porosity of the soil; it will be right, after levelling and treading the part b R perfectly, to cover the same with 3 or 4 courses or linings of puddle, joining the same perfectly with the puddle-ditch, and the puddle round the well, to which courses of puddle the bottom lining is afterwards to be carefully joined; and after this is properly set, the remainder of the bank L H I E, and of the cone O P Q R, may be proceeded with, as we have before mentioned, when treating of the rearing of canal banks with puddle-ditches in them. The bank or head being completed to HI, and the well N M, and conical embankment O P Q R, being also carried up to the proper height, the well should then be copped with a layer of the best hewn flines cramped together, and the top reduced to a perfect level; and for security, it will be right to pave the surface of the top P Q, and for some distance down the sides of the conical embankment, with paving flines pretty well jointed, and set their longest way into the soil, filling their joints with mould, and sowing grass-seeds therein, to prevent the waves from afterwards loosening the flines or wearing the bank; this conical bank is for enabling the water to fall into the well on all sides; if the well was made in a corner of the reservoir, much digging would be required, both for the arch or pipe to let out the water, and for the discharging arch D M.

We have been thus particular in describing the circular weir or well-fall above recommended, from having seen the beneficial effects of one, in the reservoir for Worley mills near
near the duke of Bridgewater's canal; and the mischief that is sometimes done to the banks of a reservoir and the adjoining lands, by letting off the flood-waters by common works or tumbling banks at the corners of the reservoir, and allowing it to fall or rather run its own way down into the valley. Reservoirs constructed on the above principles would be secure almost from accident, however high the embankment, or sudden and copious the floods, if the well is made sufficiently large, and deep of water at the bottom, to receive the shock of the preceding column of water. If the floods are so considerable as to bring down timber and other large floating matters, it will be necessary to fix a strong grating or circle of bars round the top edge of the well bank PQ. It will sometimes happen, that a reservoir is over or near to the navigable tunnel of a canal, and might be let down into the same by a pipe and cock, as at Ripley on the Cromford, and near Brampton on the Grand Junction. It will be proper, that the core or plug of the cock to a reservoir should be turned by an endless screw, or by toothed wheels, so that considerate power and nicety in the adjustment of the stream let out, by the turning of the cock, may be attained; and a regilier should be provided of the number of turns, and fractions of a turn, that is given to the winch or handle in any cafe. It will be proper to flanch a small pipe to the large one, and connect the same with an inverted glass fathom filled with mercury, in the arcli near the well, so that by turning a cock, the height of the mercury should indicate on a scale attached, what depth of water there is in the reservoir above, or how much it wants of being full at the time. A series of accurate experiments should be made, by gaging the stream of water at D, or at the first convenient place below it, which the cock discharges per hour or day, when the water is at different heights in the reservoir, and with different turns of the cock-gives; these shall all be repeated, and sufficiently numerous, to enable the engineer by interpolation, to fill up and form a table, (that the committee ought carefully to preserve copies of) by which at any given height of mercury, the cock can readily be set to discharge any number of locks full of water that may be required per day. No great difficulty would attend the forming of a gauge-puddle, instead of, or by the side of the brafs cock that should regulate itself, and discharge any regular and continual quantity of water that the reservoir could supply: see Leybourn's Repository, vol. ii. p. 165. It will be right also for the engineer and committee, to have tables for readily shewing the quantity of water that every reservoir contains, at each foot or shorter portion of its depth, indicated by the mercury in the fathom, or by a graduated gauge-foil fixed up in any part; for forming a table of this fort, where a complete survey had not been made or preferred at first, the time of a hard froil should be chosen, and a sufficient number of holes at equal distances, in a great number of parallel or equidistant lines, should be bored or cut through the ice sufficiently large to let down a plummet to found the depth, and if this is done with care when the reservoir is full or nearly so, a most correct table of its content at different depths, can be thus obtained by calculation. Some of the considerable reservoirs that have been constructed principally are, at Aldenham, Rivington, and Wigan on the Grand Junction; Kifflon on the Forth and Clyde; Brandstone, and Denton on the Grantham; Ripley on the Cromford; Amlforth on the Nottingham; Littleborough on the Rochdale; Marfen on the Huddersfield; Oxendon on Leicestershire and Northamptonshire Union; in Rudyard vale near Leek, for suppling the Caldon branch of the Trent and Mersey canal, which covers 150 acres, has its head 30 feet high, and the water in general very deep. Mr. Hornblower has calculated about the year 1870, on the canal of Luné in the south of France, occupies a space of 553 acres, and is 1000 feet round with a branch, and its waters let out without, by a large pipe. In engineering fioors or channels to convey water to a canal from springs, brooks, or reservoirs above its level, the same care must be taken to examine the nature of the soil in each part, and to apply a being of puddle, as has before been mentioned respecting the line of a canal, whereby porous fluid is to be cut through. Where there are a great number of inundations in the ground, through which a feeder is to be conducted, that would occasion it to be very crooked and much impede the cultivation of the land, it will be proper, in many instances, especially if the land be valuable, to cover over the feeder in a culvert or small arch of bricks, of 12 inches or 2 feet diameter, or larger, if the supply fluid at any time require the same: in very porous soils, these culverts, inclosed in puddle, will be the most effectual way of preparing and conducting small streams of water, and no land will thus be lost to cultivation. In some places, feeders will require considerable embankments and aqueducts, to cross valleys and streams of water, and preserve their level, or gradual and small fall; and in many of such cafes it will be cheaper and better to use cast-iron-pipes well jointed and flanged, and laid within the ground, down one side or bank of the vale to be passed, and up the other, securing each end carefully with a strong box full of holes, or a fine grating to keep extraneous matters out of the pipe. In the case of smaller feeders, particularly those temporary ones, which are required to supply water to puddle with, and to fill the bottom of the canal for the temporary use of dirt-boats while making it, as before mentioned, cast-pipes in short lengths, in which the most crooked parts of large trees will come into use, may be advantageously used in crofting hollow roads, or other hidden ravines, if the same be jointed by short hollow double cones of cast iron as recommended by Mr. Hornblower: see Repository, vol. x. p. 25. It has often happened, where reservoirs are situated at some distance above a canal, and a brook-course led from the reservoir to the canal, that the water was left to take its ancient course on being let out of the reservoir; an expert engineer will, however, carefully examine all such feeders, for thus they ought to be considered, and fill up all deep holes, and lower the shallows in the brook-course, so as to reduce the channel nearly to an uniform width and depth; and very accurate gauges of the water ought to be made at different seasons of the year, of the quantity issuing out of the reservoir, and the quantity received into the canal; if these differ materially, intermediate and comparative gauges should be made of the stream, under the faulty or leaky ground is discovered, probably some fathom of sand or open-jointed rock; over which the brook-course or feeder ought to be carefully lined with puddle: and, if puddling-fluff be scarce, the foil very porous, and the brook-course very crooked, it may be the most effectual way, as well as the cheapest in the end, to pass such leaky ground by a small culvert, inclosed in puddle under ground, by the side of the brook-course, as straight as the course of the valley will admit. Except in situations, where mills in the vicinity of an intended canal are much in want of water, or their owners or others dissatisfied with the scheme, has been usual to allow the company to search for, and divert to their use all springs of water, within certain limits on each side of their line; in the acts for the Newcastile underline Junction, the Southampton, and Salisbury, and the upper part of the Tamron Manure canals, this limit is fixed at 1000 yards; in the Aberdeen, Polbrook, Tammar,
Tamar Burne, lower part, Thames and Medway, Wills and Berks, and others, is fixed at 2000 yards on each side of the line. In such cases, an accurate investigation and knowledge of the Strata, upon Mr. Smith's principles, will be of the most essential importance, in order to collect and retain springs that are above the summit level, or even in lower situations, where a local trade is to be provided for. It has been usual in some mining districts to require, that engines near an intended canal should lift their mine-water into such canal, or high enough to be conducted into it by a feeder, as on the Birmingham and Finsbury canal. It will be worth considering, on a summit, where water is scarce, whether a tunnel may not be more eligible than deep-cutting, on account of large springs which would be interfered with by the lower level of the former, when the deep-cutting tunnel perhaps be in porous stuff, or perhaps in dry open rock. As the summit levels or low points of most canals are in deep-cutting, through a considerable portion of their length, it is often attended with but little additional expense, except in the case of tunnels, to make such summit levels or two feet deeper in water than usual, as on the Derby, Cromford, Manoe, Alton, and Oldham, Oxford, and other canals, in order that such additional depth, being filled in winter time or wet seasons, may act as a reservoir for drier ones: but it has not always been considered, that such deeper levels, when filled 18 inches or 2 feet fuller than is necessary, occasion the necessity of letting off twice that extra depth of water, over the area of a lock, each time that a vessel passes the summit; by which, such refree of water is in a great measure diffipated before the dry season for which it was intended. We should recommend, either the use of reservoirs, so much above the summit level of the canal, that they could be emptied into the same, when the continuance of dry weather required it; or, if such deeper summit levels be made, on account of their considerable length for holding water, that a lock capable of penning 18 inches or 2 feet, and of flushing very tight, should be made in each end of the summit, to be used as long as the summit water is higher than usual, but which might at other times be left open, when the water was level on each side of them. Before we quit the subject of supplying a canal with water, we beg to mention, that it may be worth the while of the engineer, where water is to be pumped up to supply the lockages, as we have before mentioned, to design and calculate the expense of wind-machines, capable of doing the required work, and of the probable expense of their repair; and to compare the same, with the cost of erection, expense in fuel, attendance and repairs, of well constructed steam-engines to do the same work.

On the erection of Aqueducts for conveying a canal over any very deep and wide valley, or over a large or navigable river, we beg to mention, that a most secure foundation must be sought for, by sinking, or obtained by piling, for the piers of an aqueduct-bridge, and that the arches ought, in every case, to be arches of equilibrium, because the load setting in brick or stone bridges, by letting through the water, may prove of the most fatal consequence. That the plan of an aqueduct-bridge should be curving inwards, that is, the ends should be wider than the middle, the walls should not be upright, but battering or diminishing upwards without, to give greater strength and liability to the whole; the materials, if of stone or brick, and the cement, should be of the very best quality, and the work executed in the summer season only. In Plate II. Canals, figs. 19, 20, and 21, we have given a plan, section, and elevation of an aqueduct-bridge, proper for crossing a considerable river, where, in fig. 19, A is the river, B the canal, C the towing-path, and D D the wing-walls, for keeping the embankments at each end of the bridge; in fig. 20, C is the towing path, and a a a lining of paille to secure the canal B from leaking. Care should be taken that all the joints of brick or stone are worked as close as possible in an aqueduct-bridge, and thoroughly filled with cement; the spaces within, and the bottom for the canal, should be made rough, that the puddle may the better adhere to them, and that the puddle may not slip, owing to the steepness of the sides, which must be more than in other parts of the canal, to avoid unnecessary expense of masonry or brick-work in the width of the bridge. The lining as above is, however, liable to be soon cut away by the barges. Since the year 1795, a new kind of aqueduct has been introduced into this country, composed partly of cast-iron, which promises the greatest advantages, except perhaps, where free-streams of an excellent and durable quality is found upon or very near to the spot, or where the space is very distant from any iron mine, or of the navigations that comport with such.

In the year 1797, Mr. Thomas Telford, the engineer, wrote an account of the inland navigation of the county of Salop, which has since been printed in J. Playne's Report to the Board of Agriculture, on the Agriculture of Shropshire, and we beg to extract therefrom what he says on this subject when speaking of the Shrewsbury canal. p. 296, as follows:—

"This canal passes over the valley of tern, at Long, for a distance of 62 yards, upon an aqueduct made all of cast iron, excepting only the nuts and ferrules, which are of wrought iron; and I believe this to be the first aqueduct for the purposes of a navigable canal which has ever been composed with this metal. It has completely answered the intention, although it was foretold by some, that the effect of the different degrees of heat and cold would be such as to cause expansion and contraction of the metal, not being equal to extend or draw back the whole mass of the aqueduct, would operate upon the separate plates of iron so as to tear off the branches which connect the plates lengthwise, and break the joints. Others said, that the expansion of freezing water would burst the sides, and so break off the branches which connect the sides with the bottom plates: but after the trial of a summer heat, and the very severe frost of the winter of 1796, no visible alteration has taken place, and no water passes through any of the side or bottom joints. After the frost had continued very severe for three or four days, and the water had not been drawn off (although there are means of doing so), but it had frozen in the aqueduct above the height of two feet six inches, the ice had then frozen to the thickness of an inch and a half, but instead of having forced out the sides, it was melted away from them, and quite loose upon the surface of the water. The idea of having this aqueduct made of cast iron was first suggested and recommended by Thomas Eyton Esq., then chairman of the committee: after due consideration, it was approved by the committee, and the principles of construction, and the manner in which it should be executed were referred to Mr. William Reynolds, and the writer of this article, Mr. Telford who, after several consultations, and forming and considering various plans, at last determined upon that which is represented by the annexed engraving. (Plate III. Canals, fig. 22.)"
In March 1796," Mr. Robert Fulton, an American engineer, who happened to be in this country at the time, seems to have availed himself of what was going on at Long aqueduct as above, and of the machinery of various kinds, in use upon the Keelby and Shroffsbury canals, and to have prepared drawings and models of a variety of such machinery, with many improvements of his own, and submitted the same to the examination of a committee of the Board of Agriculture, in March 1796. These have since been published in a handsome quarto volume, entitled, A Treatise on the Improvement of Canal Navigation, by R. Fulton, from which, p. 113, we beg to extract what he says on constructing aqueducts of cast-iron for a narrow canal as follows: "The butments and piers being raised, it will only be necessary to extend two pieces of timber across the span; each to be braced back to the piers, and covered with cloth to form a flange or scaffold, which will suffer every purpose of centres necessary to works of iron. The iron-work, in the section (Plate III. Canals, fig. 23 and 24.) may all be cast in open mould, and of the following dimensions: Superfposing the span 100 feet and the spring one-sixth of the span. First, three segments of a circle, each in three pieces, about 36 feet long, eight inches by four diameter, to be united, as at A. Second, three straight bars, to extend from one pier to the other, to be of the above diameters, may also be cast in three pieces, which bars are to extend along the top of the segments to the piers, and form a line parallel to the horizon; the bars and segments to be united by perpendicular flanges like B, ten or fifteen feet distant from each other. The mortar in the lower end of the flange being thirteen inches long, will be sufficient to secure the segment, and leave room for a hole two inches square, through which a cast-iron C, is to pass; and fallen in the time and expense will be considerable; the brace to have a mortise, cast on each side of the flange, in order to tighten the work by wedges. On the top of the flange, the square hole to receive the cross brace may be beneath the mortice, as in the figure; by which means the whole may be combined, and form an iron flange to support the troughs. The troughs should be at least one inch thick, the side plates six feet broad, and as great a length as can conveniently be cast; which may be performed twelve feet, and perhaps more in length; the flange to be outside on these plates. The bottom plates may be six feet wide, thirteen feet long, seven feet plate, and four arms projecting, each three feet long, in order to support the horse-path and braces, as exhibited at D. Two of these plates laid across the flange, and screwed together, with a flange under, will compose a length equal to one of the side plates, which may either meet or break joint as is thought proper. The whole may, in this manner, be screwed together, on packing of wool and tar, and have the seams pitched like those of a ship. On the plates composing one side of the trough, small brackets, about three feet from the top, must be cast, as at E, in order to support the horse-path; perpendicular rails, eight feet long, being raised from the arms of the bottom plates, will support the outside of the horse-path, also the iron railing, as in the section. By this mode, two patterns will answer for the whole of the trough-plates, and but few will be required for the springs, rails, and spurs; while the saving in time and expense will be considerable; particularly where it is necessary to bring the flange by long land carriage; for the arches being dispensed with, and the work not more than one third of the dimensions necessary to an aqueduct of stone, will most materially reduce the quantity of masonry. "In aqueducts of stone, one of the great difficulties is to line and puddle so tight as to prevent the water penetrating into and injuring the masonry; but in one of iron, should a leak take place it will instantly appear; and on shutting the stop-gates at each end, and discharging the water, it may be slapped in a few hours, if not in minutes, by this circumstance in aqueducts as, perhaps, one of the greatest prejudices; they are not occasionally liable to injury, and only feel it to the corroding tooth of time." Since the above period, a most improving work of this kind has been undertaken by Mr. Jelfey, on the Eids famine canal, and is now nearly or quite completed, for crossing the Dee river at Pontyfynydd, about 20 miles S.W. of Chester; where nineteen massive conical pillars of stone, at fifty-five feet each, have been set, being supported by the middlemost of which, no less than 135 feet in height, support between the top of every pair, a number of elliptical cast-iron ribs, which, by means of uplifts and horizontal bars, support a cast-iron aqueduct about 329 yards long, 20 feet wide, and six in depth, composed of massive sheets of cast-iron, cemented and riveted together, having on its south side an iron platform and railing for the towing-path. In May 1796 Mr. James Jordan took out a patent for suspending aqueducts from ribs of cast-iron above them, in the same manner as his suspended iron bridges. See Repertory, vol. vi. p. 252. Among the most considerable aqueducts of stone or brick are those at Lancaster on the Lancaster canal, for a description of which see our article Bridges. At Kirkintilloch and at Kelvin on the Forth and Clyde, Chink on the Ellesmere, Marple on the Manchester Ashton and Oldham, Monk-bridge on the Trent and Mersey, Whaley-bridge on the Peak Forest, Avoncliff and Dunns on the Kennet and Avon, &c. while at Burton on Bridge-water's, a navigable river is passed, and near Wigan on the Leeds and Liverpool, another canal (the Lancaster) is passed upon aqueducts. It was thought a bold and visionary scheme by many, which Mr. James Bridley proposed, of crossing the Mersey river at Runcorn Gap, by an aqueduct bridge, but no doubt he could have accomplished it.

The making of Embankments appears to have been long practised in China, where we read of parts of their canals of 200 feet wide, that are embanked 20 feet high, for great lengths together; the rivers through the towns of Cambridge and Lincolnshire in this country, have also been long confined thus, by artificial banks. Most of the embankments of which we have been speaking above, have less or greater lengths of field mounds or embankments for forming the canal upon, to the proper height, and for joining them to the aqueduct bridges; all the observations and remarks which we have made, respecting the setting out and ascertaining the dimensions of the head of a reservoir, will apply to embankments; except that a prism whose base is the figure G H L M N O I. Plate IV. of Canals, fig. 25, and length A B, fig. 16. Plate I. is to be calculated from the triangular embankment D G F, first to be calculated, instead of the triangular prism G H I. The angle of the figures ought to be determined by the result of similar inquiries, and the same precautions used to prevent slips, in soils that are so disposed, as were mentioned respecting reservoir heads; it will generally be a safer way to carry up a puddle-ditch in each bank of the canal, as at a, b, f. fig. 25, than to trust only to lining of the canal L M N O. In every considerable embankment there will be required one or more arches to carry a brook or river under the canal, and, perhaps, others for roads to pass through; such arches should always have an inverted arch turned below them, deep enough for the bottom of the brook, and below the roads, and the arch itself should be one of equilibration. To avoid making a very large arch for a brook or small river, it is usual to make a road or communication arch near it, with.
its bottom well paved, and no higher than the surface of the meadows, which will serve to vent the sudden flood in rainy seasons.

Great care should be taken to slope off and finish the ends of arches under an embankment, agreeable to the slopes or sides of the banks thereof; by which the banks are prevented from moulderimg down into the brook or road-way, and awkward projections in the slopes of the banks are avoided; at the entrance or upper side of a water-arch, or of road-arches which will occasionally become such, return or wing-walls of brickwork or stone should be made, for some distance along the bottom of the slope of the embankment, and the sharp corners of the entrance of the arch should be a little rounded off, to prevent the rapidity of sudden floods from wearing or injuring the bank. It is to be observed, in conducting a canal along the side of a steep and high hill, as Plate L, fig. 3, that after a certain degree of steepness of the ground A B D, it will not be possible to cut the canal, upon the principle that the excavation E F G I K shall just form the bank A B C E, but such banks will often require stuff to be provided from other places, and such are indeed cases of embankment: and here it may be proper to advise, that new banks, as A B C E, ought not to be placed on very steep ground, as A E, without considerable care in first forming it into levels like steps, to prevent the slipping of the new part, as happened near Bradford on the Kennet and Avon canal, after all the care that was taken, and great lengths of the canal banks slid down into the Avon river below, the making of which good again cost, we were told, near 1000l. Among the considerable embankments that have been made for canals, are those at Bollin and Stretford on Bridgewater’s, and Wolverton, Weedon, and Bugbrook on the Grand Junction, &c. but the greatest extent of high embankment known, is that in the valley of the Boyne, in the Grand canal of Ireland; and the highest bank in the world is also to be found on the fame canal in the valley of the River Rye; it is above 90 feet high. We are told, that Mr. James Brindley used a kind of caisson of planks, in forming his great embankments, in which dirt boats were used, to bring stuff from the higher ground, that had been cut through.

We have next to speak of Safety-gates, Stop-gates, and Stopplanks, which are different contrivances for stopping the water of a canal in case the banks are falling in any part, or that any part wants repairing to repair the works. Advantage is generally taken of the walls under the bridges, for constructing these contrivances, where the face is thrown in the proper pitch; otherwise the canal must be contracted by upright walls, the same as is done at the bridges on purpose for them. For explaining the nature of safety-gates, we must retrace to fig. 26, where A B is supposed to represent the top of the wall, or height of the towing-path under a bridge, C D the surface of the water, and Q S the bottom of the canal; E F G H is a pier of hewn stones, or a piece of found oak timber let into the wall, its face being flush therewith; I E G and H F K are reccefs about two inches deep in the wall; similar provision is made in the opposite wall, for receiving doors or gates L M and N O across the canal, turning on centres or hollow-quoins at M and N: each gate is so balanced by a counter weight, that they rest always in the position represented; and they are intended to operate thus; suppose, owing to the sudden breaking of a bank, the water in the canal should acquire a current from Q towards S, the floor would pass under the gate at P L, to facilitate which, the corner of the floor at P is flopped off; the gate would be turned up into the position M E, and the canal would be thereby closed up. The like would happen by the other gate N O, in case of a current the contrary way. Safety-gates should be placed at proper distances on every long level or pond of water, especially if the fame is much embanked; both to prevent the loss of so much water, in case of a bank breaking, and the mischief that the fame would do to the lands, mills, &c. below the breach. We read of a new bank breaking on the Warwick and Birmingham canal, and destroying a gentleman’s park-walls; and in the year 1783 to great a breach suddenly happened on Bridgewater’s canal, near London bridge on the Chelten road, that three barges were carried through the fame a great way out into the fields. A single safety-gate ought to be placed at the end of every long embankment, to stop the water in case of a breach happening in its banks. Stop-gates are similar in their construction to the safety-gates above described, except that the gate lies flat on the bottom of the canal instead of being balanced, and has a chain by which it can be hauled up, whenever occasion may require the canal to be stopped. Stopplanks are a simple, though not so expedient a provision for stopping a canal as the last; a groove is provided in the two opposite walls under a bridge, or in a narrow and walled place, and a sufficient number of well jointed planks are provided, to be dropped into the groove whenever the water is required to be stopped, and hence these are often called drop-planks. In very large works like the London docks, a barge or vefsel is built in the place, whose head and stern posts exactly fit into a groove as above, and the vefsel can be floated into and out of its place, or sunk therein as occasion may require. The engineer will also have to make provision, while the canal is digging, for fhop-bars at the several intended toll-houses, or other places where it may be necessary to stop barges in the night, or in case of any dispute about their landing: these bars are composed of a large baulk of fir timber floating on the water; and a small arch capable of containing such a floating beam of the proper length is provided under the bank, so that when the trade on the canal is required to be stopped, the toll-clerk has only to draw out the beam by means of a cord attached to it, until its end enters a recess in the opposite wall, and then to lock the beam fast.

We shall next describe the Water-gates, Trunks, Tumbling-ways, or Wires, that must be provided, for letting off the furious water of a canal in wet times, for keeping the water to one certain height, or drawing it off in case any repairs may be wanting. Water-gates are sluices of the common kind, in the side of a canal, where any considerable quantity of water is required to be let out, and are to be drawn up, either by a rack and pinion, a chain and roller, or a number of holes for a crow-bar, as circumstances may render most eligible; where lesser quantities of water are to be let out, or for emptying certain lengths of the canal between the stop-gates or planks, when occasion may require; trunks formed of oak or elm planks, well jointed, should be laid into the bank, at the bottom of the canal, and carefully inlaid in puddle, with a valve or shuttle that will shut very tight, and can be readily drawn when the water is required to be let off: we beg to recommend, wherever wooden trunks are used for any such purpose, that they should be funk so low, or the mouth where they discharge should be made up, so that the trunk may always remain quite full of water, and the air be let all times excluded; in which situation wood will last much longer than if wet and dry alternately.

In the choice of situations for weirs, to discharge the surplus water of a canal, care must be taken not to let off any considerable quantity at any time, but into a brook coulfe or bottom of a vale, that is crossed or proceeds up to the canal, and has ditches through which the water can escape, without
without tearing or doing injury to the land adjoining. The most frequent tumbling-bays or weirs to discharge water from canals are composed of stone walls of brick or masonry, as see, Plate IV. Canals, fig. 27, whose top y is capped with heum and well jointed stone, or with a flat fill of oak, the top of the same being just level with the top-water line. A B Y M is a paving of large stones for the water to fall on, and escape at A, and A B Y C are wing-walls at the ends of the weir, to keep up the bank and confine the water. These weirs are generally on the towing-path side, on which a low plank bridge, as C D, is supported over it, called a weir-bridge. When these weirs are wanted of considerable length, the wall y c ought not to be straight but on a circular plan, curving inwards in the middle, by which it will be better able to support the lateral pressure of the bank behind it; a puddle ditch should be carried up immediately behind the wall, allowing the course of puddle to fet thoroughly, before others are applied, that the great pressure of the confined puddle may not overtop or disturb the wall; and the paving AC should be of large and well jointed stones, and if let upon an arch of puding it would be a further security against their washing away, which too often happens. We have seldom seen any considerable weirs or tumbling-bays of the above construction, but where it would have been better to have followed the example of Mr. James Brindley, on Bridgewater's canal, and have made a circular- weir, or well-fall, on the upper side of the canal; we have spoken of these when treating of the general improvement of a valley, as also in the making of reservoirs, but it may be proper here to refer to a section of such a well fall in fig. 28, where A B P is supposed to be the section of a vale crossing the canal C F G; A M is an arch of brick-work, secured on its upper side at head, with a covering of puddle, and MN is a wall, whose footing or lining of brick or stone is groined into the arch at M, having a well paved floor, three or four feet below M, according to the height NM, that the water is to fall, and a coping of hewn stone, or a large curb of sound oak at its top. I O P Q R P is intended to represent the section of a side pond or wider place in the canal, from which the water may drop quietly into the well at N from all sides, and run off at A.

For letting a proper quantity of the surplus water of a canal forwards into the ponds below, a small weir is generally constructed in the walls at the head of each lock, which lets the water down into the puddle-holes, or crooked arches that convey the water for filling the locks, and hence such are called puddle-weirs or lock-weirs. The upper gates or doors of the locks are often boarded no higher than the top-water line, and therefore act as weirs for discharging surplus water into the lock; and gates of this sort are called flood-gates.

On the construction of Culverts, or drains under a canal for conveying away water from the upper to the lower side of the canal, it remains for us to say, that they should be carefully apportioned in size to the stream that is to pass through them in floods, and should be constructed of sound brick or stone work, and inclosed, or at least well covered on their upper side with puddle. Many engineers have used wooden trunks for this purpose, but except wood be in great plenty, and of the best quality, and good bricks or stone very difficult to be procured, it is not advisable to use perishable materials in such situations. If the ground be moory or bad, and a culvert must lie pretty near to the bottom of the canal, and have but a slight covering, it may be proper, in some situations, to use cast-iron cylinders flanked together, as was done under or near the Staffordshire and Worcefter canal; and such may be made cheaper and easier of carriage, by being in two or three segments longitudinally, to be flanked together before they are laid down; and in such situations, possibly leaden rivets might be cheaper and more durable than wrought iron ones, or nuts and screws. If bricks are to be used in culverts, over soft and moony ground, or quick-founds, a cradle composed of ribs of wood and boards or rails, such as are used for centering, should be prepared, suitable to the outer curve of the intended culvert, and such a cradle should be carefully embedded, in the proper place to receive the bricks of the lower segments of the culvert; for want of such precaution many a culvert has sunk partially, perhaps owing to the springs excavating the land or fill from below, and has been broken, to the great injury of the canal. Culverts are of so much importance, that too much care can hardly be taken to make them solid and secure, and to cover them effectually with puddle; another hint we would here give, respecting the choice of places for the culverts; they should never, if possible to avoid it, be made exactly in an old brook-course, ditch, or flough, but in the nearest found ground; and where often they can be got down to the proper depth, without any trouble from water, or lands, the same can be easily pumped out; and the stream need not be admitted to the work, until the old brook or flough is required to be filled up. In this way it is often willing that, culverts may remain during the winter following their construction, completely excluded from the frost, and therefore may be done later in the year, by filling in the stuff upon them and at their ends, and the mortar be completely set before the new channel at the ends for conducting the water through them need to be cut. And we beg to remark, that by an attention to this circumstance in making new arches under roads, and keeping the bottom of the arch much lower than is generally done, or indeed practicable in the old channel or flough, half or two-thirds of the whole expense will generally be saved; for a deep and new channel being cut to the new arch; with scouring out the brook-course for some distance below, old ford-places, if the deficient to them be easy and convenient, will not require immediately to be filled up or altered; but during any extraordinary flood, the same, if composed of gravel and hard stuff, may act the part of a weir for a short time, in carrying off the water, without injury to the road or material inconvenience to the passengers. It will sometimes happen, that a small stream of water is required to pass under the canal, in places where it is not embanked; in such cases a crooked or broken-backed culvert is to be made, as m o n, fig. 29, for passing the water from m to n under the canal C F G; this will require puddling as before described, and a strong box full of holes, or grating, should be fixed over each of its ends, as well as pits or holes be made at the upper end, deeper than the mouth of the culvert, to receive and detain the land and gravel which the stream may bring down in high rains, otherwise these, or the flumes that mischievous boys might throw into it, would in time choke it up between o and n.

The construction of Tunnels, or subterraneous arches, for drawing off or conveying of water, has been known from the earliest periods, as appears by the celebrated works of this kind between lake Copais in Boeotia and the sea; between the lakes formed by the inundations of the Nile in Egypt and the Mediterranean; as also by the cources of the Roman aqueducts, many of which were tunnelled through hills of great extent. In the mining districts of this country, we have long had levels or audits of considerable extent to mines; in the neighbourhood of Matlock in Derbyshire, the Helcar Sough has been cut through the solid rock for nearly four miles.
miles in length, for the purpose of draining the several lead mines in the vicinity; *Hunsford Moor* and *Cromford* springs, of two miles in length, and many others of less note, are also to be found at great depths in that neighbourhood. The first tunnel that was real, or, as considered for the purpose of navigation, was by M. Riguet, near Banneux, on the *Langedoc* canal, in France; and the hill in this country, was the entrance made by James Brindley to the duke of Bridgewater's coal mines at Worley near Manchester; while the first of our tunnels undertaken for the purpose of general trade, or as a thoroughfare, was by the same engineer at Harecastle on the *Trent and Mersey* canal.

It is very essential to the convenience as well as the beauty of a tunnel, that the arch thereof should be quite straight, and exactly level; considerable care will therefore be necessary in obtaining an exact section, by levelling, of the hill that is to be perforated, when a line in the exact vertical plane of the tunnel is fixed and flaked out over the hill; in doing which, it will be right to choose the narrowest place that the hill presents at the proposed level, and where also the hill rises rather boldly from such level; otherwise an expensive and troublesome length of deep-cutting would be necessary, or of the tunnel that must be dug out from above and then covered up again, before a sufficient depth of turf over head would be come at, to admit of working under ground; it will also be of consequence, when determining the exact line for a tunnel, to avoid having the deep-cutting and entrances in alluvial or disturbed and slippery foils, but, if possible, to enter at once upon the solid and undisturbed *farda* of which the hill is compos'd.

It will but very rarely happen, and that only on short tunnels, made for the purpose of preferring the level of a canal, that the workings will not be in foil more or less full of springs of water; therefore one of the first operations, after the line and level of a tunnel is finally determined on, is to search by levelling for a place in the nearest vale or brook that is some feet below the proposed level of the bottom of the tunnel; this must be more or less, according as the intended tunnel is of greater or less length; and from this point a large ditch must be opened, with a very small rife towards the end of the tunnel, as far as is practicable, and then a heading or fough must be begun, just large enough for men who are used to such works to work in, and to line it securely with bricks as they proceed, but leaving proper openings in the sides for the springs to collect freely from all sides into their heading. Some perfons have supported their headings with boards and props of wood, instead of arching them; but which practice we cannot recommend: all such works ought to be durably constructed, or should any accident or circumstances, as the want of money, &c. delay the completion of the work for some years, all this tedious and expensive work will perhaps require doing again; it ought also to be considered, that after some years or ages have elapsed, the tunnel may want repairs or alterations, and that the same headings may be again opened and used, to lay it dry in a short time, if durably constructed, which may be of the most material consequence in lessening the period of interruption to the trade by such repairs or alterations. It will be necessary to begin a heading, as above-mentioned, on each side of the hill, and work them up towards each end of the tunnel, along the line of which it is to proceed from each end, rising gently as it advances towards the middle point, that the water may run freely off; the headings should be a few feet below the bottom of the working, that will be necessary for the inverted arch of the tunnel, and a few yards off the side of it; and crofs headings or foughs must, at slanted distances, be run under the line of the tunnel, into which, openings can afterwards be made to let off the water which collects in each separate working. If the soil be rather stiff, and the quantity of water in it not very considerable, one heading may suffice; but where porous soil, with great quantities of water are intermixed, it will be necessary to branch off an additional heading, to proceed along the other side of the line, the more effectually to draw off the water; by which, perhaps, if the headings are done a sufficient length of time before the tunneling is begun, a quick sand, or similar running of the stuff, may in several places be prevented. If in driving the headings, any fissures or cavities filled with sand or loose matters, are intersected, and are found to bring a considerable quantity of water from one side of the line, it may be right to drive a crofs heading for some distance into such porous stuff, for intercepting the water before it reaches the intended workings of the tunnel.

The next operation will be to set out a line very truly parallel to the line of the intended tunnel, and to mark thereon, at equal distances, about 150 yards apart, or oftener if great expedition in completing the tunnel is required, the place of the several tunnel-pits, that are to be sunk for drawing up the stuff excavated from the tunnel, and letting down the centres, bricks, and other things wanted in the work; it will be well to contrive the line of the headings and tunnel-pits, so that they may coincide; and in great lengths of heading shafts or tunnel-pits may be sunk at intervals, to give air to the headings, and through which the stuff excavated therefore may more ready be drawn up; and it may be advisable, in some instances, to set out a line on each side of the tunnel, for the tunnel-pits to be come on one side and some on the other of the tunnel, and that both may in places intersect the headings. If bricks or flones are not at hand when the tunnel-pits are begun, and wood is plenty, the shafts or tunnel-pits may be made square, and have their sides supported by boards and struts of wood; otherwise they should be made round, and lined or fleined like a well as soon as they are done; if the soil should prove loose and full of water, it will be necessary to line the shaft as soon as such soil is reached, and to work afterwards from underneath the curb, and let the fleining sink, as is done in well sinking. Some tunnel pits have been made over the line of the tunnel, but such do not admit of being fleined with safety, on account of the weight thereof, which would damage the crown of the tunnel, where they were groined into each other; and such of them as are left afterwards for air shafts, if the soil is wet, will let an unpleasant dripping of water down upon the goods or passengers in passing through the tunnel, as we once experienced in passing through Brandton tunnel on the *Grand Junction* canal. A common roll and winch will be sufficient for drawing up the stuff and water, and letting down bricks to fill with, unless the quantity of water is considerable; but it will be proper to erect a horse gin, or turn beam, such as are used at the shafts of coal-pits, for the cheaper and more expeditions drawing up the stuff and letting down of materials, when the workings have commenced. We have before recommended a line to be flaked out exactly parallel to the line of the tunnel for the centres of the several tunnel-pits, and care should be taken that no gin, or other obstruction, be erected in this line, so that a line of firing can at any time be stretched across the top of any of the tunnel-pits, and be adjusted without fear of mistake in the exact range of this line, or parallel to the intended tunnel.

When a tunnel-pit is completed and lined, and a communication formed with the heading to keep the same clear of water; two points must be fixed in the fleining near its bottom, by letting fall or suspending plumb-lines, at the time that there is no wind to disturb their verticality, and adjusting another
another fine line between the two points on the finoing be-
low, so as to be exactly under and parallel to the line above
and consequently to the intended tunnel. The engineer
should carefully repeat his levels and transfer the level of the
bottom of the intended tunnel, or the surface of the water of
the canal therein, and mark the fame carefully in the finoing
of each tunnel-pit: and thus the workmen who are to under-
take the work will be furnished with the direction, level, and
distance of the tunnel they are to form under ground.
The work commences, by excavating a passage from the
tunnel-pit into the line of the intended tunnel, and supporting
the same properly with timber, or walls and an arch, as a
passage into the work. A piece of the intended tunnel, a
yard or more in length, according as the soil is found to
fland, is then excavated, in the proper form, place, and level.
ascertained from time to time by stretching a fine line be-
tween the marks, on the finoing before-mentioned, and mea-
suring therefrom, and using a common plummet for trans-
fering the level from the level-mark on the finoing be-
fore-mentioned; great numbers of ribs for centring should be
prepared in different segments, and in readncss to put
Together with nuns and ferews, leaving as much room in the
middle or centre as can conveniently be done, for the men to
work and pass through after the fame are put up; the parts
of two of these ribs are then taken let down the tunnel-pit, and
to be put together and fixed up in their proper place and
distance afo to the tunnel; short lengths of boards or laths
are to be prepared and fixed on their outsides, as the turning
of the arch proceeds; which, as well as every other part of
this very difficult work, requires the utmost care and expe-
rience to make it found and substantial; when this first yard
of length in the tunnel is turned and securely keyed up, the
fame is secured by ramming in clay, or proper flour, as to
fill every cavity above or without the brick-work. The workmen
then begin at each end of the piece that is
turned, one party working one way along the line of the
tunnel, and another the contrary way, until another yard or
other length of the tunnel is excavated, when other ribs are
put up and fixed together, boarded, and the brick-work is
turned round or behind, the fame as before; the utmost care
being taken to joint these courses evenly and neatly into the
former ones: the vacant space is then rammed up with earth,
and a new excavation proceeded with at each end as before.
The engineer ought frequently to renew his level-marks from
fixed and good bench-marks on the ground, and to examine
and adjust the ranging line, and also himself most carefully
inspect each working of the tunnel, and examine, by stretch-
ing a fine line along its centre, and measuring and levelling
to his ranging line in the tunnel-pit, to see that every part of
the work is proceeding exactly in the fame line, and so
that when in progress of time each adjacent working shall be
joined, and the tunnel be completed, the whole may form one
exact and truly straight arch. If the ground proves
loose and bad for flanding, it will be proper to continue the
work, by different sets of men, without any intermixture;
and care should be taken that the work never is left, even for
a night, without templetts, or short pieces of plank, being
put up to cover the roof, that is necessarily left open to admit
the men's heads and arms, while they are turning and back-
upping their last length of work at the crown; and these
templetts should be securely shored up by spars or fritts, to
prevent the earth from settling or falling in, which has
actually happened in some tunnels, owing to the neglect of
this simple and necessary operation, so that a considera-
ble length of the tunnel required to be dug out from the surface
of the ground to repair the breach. When the tunnel and
ends are completed, ditches are to be dug out, across the
headings, near the entrances of the tunnel, and a substantial
paddle-ditch carried up, to effectually dam them up, and
force the water that afterwards collects in them to rise up
into the tunnel, through cross-headings, to be left for that
purpose.
The tunnel at Bisworh, on the Grand Junction canal
being the let that has been completed (Feb. 1825) we have
ascertained the following particulars relating to it, in order
to give some idea of the present state and expenses of tunnel
making. The internal width of this tunnel is 7 feet, the
depth below the water-line to the inverted arch 7 feet, and
the foit or crown of the arch is 11 feet above the same line.
The side-walls are the segments of a circle of 20 feet radius,
the top arch of one of 8 feet radius. The sides and top walls
are 17 inches, or two bricks thick, and the bottom or inverted
arch 13 inches, or 1/2 brick thick; every fifth course of the
top arch, and every eleventh of the side walls, is composed of
two heading bricks, or wedge-like, one inch thick on the
inside and three at the back; also, every fifth and eleventh
course as above (but between the courses of heading bricks
are composed of bricks laid obliquely across the others, the
front and back corners being cut off for that purpose in the
making, for more effectually breaking the joints, of work
obliged to be done in such short lengths. The mortar that
was used, was composed of one handful of Southampton
(blue hat) and three of good sand. Six inches below the water
line, on each side of the tunnel, side-rails of fir, 5 inches
square, to keep the barges off the walls, are fixed by pieces
of oak let into the wall below them; which rails project 9
inches from the wall, and have at every 9 feet, a chock of
wood upon the rail, for the bargemen to let their pole against
for shoving their barges along. And we were told that this
tunnel was contracted for, at 15l. 13s. per yard run; the
foil principally a hard blue clay, with two or three thin rocks
in it. Sufficient headings had been executed several years
before at the company's expence. The fame contractors
were paid 20/ d. per cubic yard for excavating the deep cut-
ing at one end of this tunnel, and 11d. per cubic yard for
the other. The expence of driving the above headings were,
we understand, from 50s. to 42s. 6d. per yard run. Nineteen
tunnel-pits, some of them 60 feet deep, were sunk for the
use of the above tunnel, which cost about 305. per yard in depth
including lining. In our inquiries respecting Braunston tun-
nel, on the same canal, we were told, that 320 yards of the
fame was drove in quick-fands, and that it cost 4800l. extra
on that account. The Foulridge tunnel on the Leeds and
Liverpool canal, of 1630 yards long, proved to be in such very
loose and bad ground, that the whole of it, but about 750
yards, was obliged to be dug out from above; in some parts 30
yards wide at top, and near 20 deep, and immense works of
timber were necessary to support and keep the banks apart,
while the tunnel was turned, and the soil filled in again.
Some part of this work, done about the year 1794, cost 24l.
or more per yard run.
After a good length of the tunnel has been completed
and well backed up, and been allowed some days or weeks for the
earth to have settled regularly upon the brick-work, the cen-
tering may be removed, by loosening the screws and taking it
to pieces, to be again put up and used further on in the same
working. In tunnels upon high levels in porous soils, and
in others sometimes near their ends, or in croffing any dry
and porous stratum, it may be necessary to excavate the
bottom a foot or 18 inches deeper than usual, and to fill the
fame up again with well wrought and thiftiess paddle, and to
turn the inverted arch, and as much of the sides as are below
the water-level, upon the same, when fit. Mr. William
Chapman, page 52 to 54 of his Observations, &c. before
quoted,
quoted, has given several directions for lettings out tunnels, where coal-pits are intended to be intersected and worked thereby, as at Worley on Bridgewater's, and Harcassle on the Trent and Mersey canals. It will be a matter of some importance, for the engineer to attend to the removing of the top-soil from a sufficient space near each tunnel-pit, and to cause the same to be evenly covered, or the holes therein filled up, with the stuff that is drawn up and wheeled away from the tunnel-pits; and as fail as the different parts of the tunnel are completed, retaining sufficient stuff to fill up future tunnel-pits as are not to remain for air-shafts, to cause the top-soil to be returned upon such places, to avoid a heavy expense for spoil banks, besides putting the farmers and neighbourhood out of temper by seeing the apparent waste and devastation that such works make, when carelessly or negligently performed. The want of a towing-path through a tunnel must be very apparent, to all such as have seen the tedious and barbarous process in use, of a man lying at length upon the gunnel of the barge, and pawing the walls with his feet; in narrow boats this is still more evident, where a plank is obliged to be laid across the barge for the men to lie down upon their backs, in order to be able to reach and paw the walls with their feet! The tunnel near Aitcham on the Shrewsbury canal, though of 970 yards in length, has a towing-path through it; and has one at Newbold on the Oxford canal, and many other short ones in different places. In all short tunnels, and even in long ones, if the ground proves, on examination, sound and good for tunnelling, it certainly would be worth while to give the necessary width to the arch, to admit of this essential appendage.

Among the most considerable tunnels that we have, are those at Worley on Bridgewater's canal, 18 miles in length! Marsden on the Huddersfield, 5360 yards; Sapperton on the Thames and Severn, 4350 yards; Penfax on the Leafield and Kingston, 3850 yards; Lapla on the Dudley, 3776 yards; Bifworth on the Grand Junction, 3580 yards; Ripley on the Cromford, 3000 yards; Dudley on the Dudley, 2936 yards; Harcassle on the Trent and Mersey, 2888 yards; Norwood on the Chesterfield, 2852 yards; Well Heath on the Worcester and Birmingham, 2700 yards; Morweliham on the Tavistock, 2500 yards; Oxenhall on the Hereford and Gloucester, 2102 yards; Braffon on the Grand Junction, 2045 yards, &c.

The longest tunnels that have been proposed, besides the above, were one of 5 miles on the once proposed extension of the Manchester Bolton and Bury to the Calder river; and one of 4½ miles on the Portseaouth and Croydon, through the chalk hills south of the latter place. The towns of Manchester, Kidderminster, and Southampton appear to be tunnelled under by the Bridgewater's, Stafford and Worcs, and Southamton and Salisbury canals respectively.

The execution of deep-cuttings appears to have been long familiar to the Chinese, since we read of one of their canals that are in places excavated 80 feet deep! and of others that are cut 20 feet deep for seven or eight miles in length! The setting out and determining upon the slopes of a deep-cutting of considerable depth and length, are objects deserving more of the engineer's attention, than has in too many instances been belittled upon them: the first Rep, after the line and the level of the intended canal are determined upon, should be to examine minutely the soil in every part that is to be cut in, and to prove the same by the backing of five vertical bays; if any of these, towards the centre of the hill, should be found in loose and porous soil full of water, while the ends of the intended cutting may appear to be in sound stuff; it will be worth while, in such fuch cafes, to put down pumps and erect a temporary steam engine, to pump up the water during the work, and to drive headings from such pump-shafts, on one or both sides of the intended cutting, and below its bottom, as has been before mentioned, preparatory to driving a tunnel. Should the whole of the cutting appear to be in loose alluvial stuff, full of water, and disposed to slip, or a part only of the ground at one end, as happened at the south end of the deep-cutting near Tring, on the Grand Junction canal, it certainly will be right to begin such part, by driving a heading up from a proper point below the intended cutting, and to give time for the spriung to drain off before the cutting is begun, which may afterwards proceed in separate lengths at the same time, and with much greater certainty and dispatch, by the help of cross headings, to drain off the water, than is practicable without such precaution, unless expensive and very powerful pumps or machines are used in the works to clear them of water in different places, while the tendency to slip is much increased by such sudden and partial drawing off the water. Ships are among the most formidable accidents to which canal-works are liable, and can hardly be too much guarded against; by giving an extra slope to banks in such places; but particularly by driving headings behind such parts, some time before the workings is begun, in order that the spriung may be intercepted, by which the most porous and loose stuff like quick-fiards may, in many instances, be converted to found and good standing stuff. After all, where the ftrata alternate very fast, and have a considerable dip, and any slippery matter like fullers earth or potters clay intervene, adjoining to a porous soil that can supply it with moisture, it is almost impossible to avoid slips, that will prove most disafturous in their consequences, both in expense and delay of the works; as happened in the Tring deep-cutting above mentioned, on the Gloucester and Berkeley canal, and many others which we have heard of.

When the engineer has, by a thorough investigation, as above recommended, ascertained the nature of his ground, and its tendency to slip, he can determine what slope the upper banks A B and P K (Plate 1, Canals, fig. 6.) ought to have in every part; for these ought not to be regulated by the slopes C F and I G, against which the water is to lie, and the waves of the canal to act, but be as steep as the ground or rock will stand, in every considerable length together; and the degree of the upper slopes will be liable to vary accordingly; if these are too much sloped, a wale or land of land and of labour in excavating and making spoil-banks will be occasioned, while if they are made too steep in slippery or loose wet ground, slips may happen that will occasion still more serious expenses, and delay also. All these preliminaries being settled, and the width in every part calculated, a number of slope-holes must be dug at A and P, and a lock-fipt dug out to join them, by a careful workman, as mentioned before on the marking out of the canal; and the top-soil being removed and clamped, from a sufficient space for flowing the stuff, the work will then be ready for the contractors to begin digging. This will be our proper place to notice several machines, and contrivances for facilitating the operation of excavating of canals, docks, or other deep-cuttings. The most simple and usual method for small depths is by runs of wheeling-planks, supported in an oblique direction up the side of the bank upon horining-blocks of different heights, on which the labourers wheel out the stuff. In larger works, turn-banks or soap-firn are erected on the bank, and a level-grade or scaffolding erected over part of the deep-cutting: two ropes wind and unwind contrarily ways off the drum or barrel of the gin, and pass over pulleys fixed over the end of the stafge; these ropes terminate in three smaller ones, two of which have at their ends
rings, and the other a hook, of iron. When a loaded barrow arrives on the run below the slape, a labourer stands ready to flip one of the rings on to each of the handles of the barrow, and to hook the other end into the felies of the wheel; when the revolution of the gin draws up the loaded barrow up the slape, another labourer, who had previously hooked the three rings, and affixed them in like manner to an empty barrow that is to be let down, while a full one is advancing as before, by the other rope. The loaded barrows are wheeled away upon the slape, and run thence to any place above that is desired. At the London Docks, we saw a very simple method used; two strong poles were set fast into the top of the bank of the dock, at 40 or 50 yards from each other; and at about five or six feet high on each, a large common pulley or ship's block was fastened, by a short length of rope; through these blocks a strong rope was run, whose ends terminated in two small rings, with rings at their ends, as before mentioned: the length of this rope was so adapted, that one end reached to the bottom of a very steep run or plane of planks that were laid and fixed on the bank, pointing up to the poll at top; while the other end was nearly at the top of another similar plane at the other poll. At a proper place between the two pulleys, the whipple-tree of a horse's harness was attached or lashed on to the rope. The operation was conducted, by a man arriving at the bottom of the plane with his loaded barrow, the wheel standing at the foot of the plane, the end of the rope being at the bottom of the plane, and the horse standing still near the poll at its top; the labourer then flipped the two rings on to the handles of his barrow, and the horse being in motion towards the other poll, the barrow was drawn up the plane, and the man also with it, who made use of his feet, retaining himself from falling backwards by holding fast by the barrow handles, which he at the same time was enabled to guide; when arrived at the top, and entered upon a plane there of less inclination, the horse had arrived almost at the other poll; and while he was stopped, and was turned round ready to return again, by the boy who attended him, the labourer flipped the rings off his barrow handles, and wheeled the same away upon the upper run; another labourer instantly flipped these rings on to the handles of his empty returning barrow, and the return of the horse let him and his barrow down the plane again, the handle going first, and the man holding them as before, but with his back to the barrow; while the other ends of the rope were drawing another labourer and his loaded barrow up the other plane as before. The simplicity, dispatch, and perfect operation of this contrivance, do great credit to its inventor. In very considerable works, it will be attended with the greatest dispatch, as well as ultimate saving of expense, to use trains and temporary iron rail-ways; and if the height and quantity of stuff to be delivered at any one place be very considerable, inclined planes, with steam-engines of small dimensions, (such as are now every day manufactured and improved) should also be erected, to draw up the trains, as at the London Docks above mentioned. It is evident, that the simple and straight course for the horse, attached to the middle of a rope as above, may often be substituted for the expensive turn-beams above mentioned, particularly where dispatch in setting the apparatus to work is an object.

Mr. Ralph Dadd appears to have contrived a machine to be worked by men, by the means of levers, for excavating canals, which was tried in the year 1794, in the deep cutting at Dawley near Hayes on the Grand Junction canal. Mr. Carnes machine for the same purpose, but worked by a horse at length, appears to have been used in 1794, in the deep-cutting near Colton Hacket, on the Worcester and Birmingham canal. In the Monthly Magazine, vol. ii. p. 594, we have the following account of the operation of E. Hefferns patent excavator: 'This machine takes the soil from the bottom of the canal, at 40 feet deep, with equal facility as at six feet from the surface! One of them is at work upon the Gloucester and Berkeley canal. By the assistance of two men only, it removes 1,500 loaded barrows from the bottom of the canal, to the distance of 40 feet, in 12 hours; and is so contrived, as to take up the loaded barrows, leave them at top, bring down the empty ones in regular rotation, and leave them at the bottom. It can be moved along the canal to the distance of 26 yards in 10 minutes, by the two men that work it.'

In October 1793, Mr. Joseph Sparrow took out a patent for a machine, consisting of a box, with its bottom opening on hinges, suspended by a port of unselfish grief or crime, the whole moving upon wheels; which he strongly recommends for elevating and discharging the soil dug out of the canal. See Repository, vol. i. p. 77.

Among the most considerable deep-cuttings, are those at Ashton on the Lancaster, Trinity on the Grand Junction, Colton Hacket on Worcester and Birmingham, Burbage on the Kennet and Avon, Little-borough on the Rochdale, Smethwick on the old Birmingham, &c.

The construction of locks is so important a part of canal-making, and they are so very essential to the system itself, that we shall give some brief particulars of their history. Mr. William Chapman, in his "Observations on the various Systems of Canal Navigation," has devoted his 7th chapter to an account of the internal navigations of China, compiled from Sir George Staunton's and other authentic accounts. He observes, that our pound-locks are unknown in China, (although explained to them by the French missionaries in 1685;) and it appears from his account, page 76, that their grand or principal canal is, in fact, only a river or stream navigation, although greatly diverted by art from its ancient course in some parts; the current of the water being low, and prevented from running off too rapidly by its defile being occasionally checked by flood-gates, consisting of two abutments of stone, one projecting from each bank, and leaving a space in the middle just wide enough to admit a passage for the largest vessels employed upon the canal; and to prevent unnecessary waste of water through the flood-gates, the passages are occasionally closed by planks let down transversely and separately one above another, their ends reining in a vertical groove in each abutment, and he observes, at page 80, that it was probably between the years of the Christian era 603 and 618, that these were introduced. At page 87, he says: 'The Chinese method of overcoming aecents appears to be long subsequent to the attempts of the Egyptians, under the succors of Alexander, who, according to Monf. Huet, bishop of Avranches, had the art of constructing sluices, or locks of one set of gates, so as to stop the impetuosity of the current, and be occasionally opened. Though termed gates, the openings were most probably closed with beams of timber, let down in grooves; as gates of large width and depth could not be opened without difficulty, even against a small difference of level. There are, however, such sluices with gates upon several of the running canals on the verge of the Shonan. They were erected about the middle of this century, (1750) and are of difficult use, because of the force requisite to open them. These running canals are on the Chinese principle, and nothing more than new channels for a portion of the river; which, when it is low, are stopped as in China, to retain a head of water sufficient to pass the boat." And Mr.
upon, and cause the gate to open and shut easily: the height of the roller above mentioned is made adjustable by a screw, so that the gate can at all times be kept from dragging on the sheeting; and instead of handles to open such gates, ropes and chains, and caplans, erected on the banks for the purpose, are used to open and shut them. The upper gates are hung and constructed nearly like the lower ones, except that they have no paddle-holes in them, and are usually hoarded no higher than the level of the paddle-ways behind them, in order to allow as weirs in carrying off a superfluity of water; but these are often attended with bad consequences, the fall of the water wearing, and in time damaging the breadth of the lock; and in floods, the stream or splashing of the water may damage goods in, or even endanger the linking of, heavy laden boats, in the lock; the same may also happen with deeply laden boats when the paddles are drawn in ascending, if the paddle-holes do not enter the chamber of the lock at some distance below the surface of the water, and in a proper direction: on the Shannonshire Canal the paddle-holes are both united, and discharge themselves through the breadth of the lock into the chamber; a peculiar arrangement to which it is mainly owing that many of its new locks were soon found to be filled with rubbish, the upper paddles, or those behind the upper gates, are drawn by a rack and pinion, &c., by means of a winch-handle, (which each bargeman and lock-keeper carries with him) in the same manner as those in the lower gates, which we have described above. Guard-rails or curving pieces of timber, &c., fig. 36, ought to be strongly bolted on to piles driven for that purpose in the front of the wing-walls just above the surface of the water, to guide the boats into and out of the locks, without striking the walls; which is far preferable to the huge flumes let into the wing-walls in some places, called pumping flumes, and calculated rather to break and destroy the barges, than protect the walls. It will be necessary also to provide a strong piece of wood formed to the curve of the breadth-wall of the lock, &c., fig. 37, before which it should be suspended a few inches above the water when the lock is empty, by means of two or three chains; these are called bumping pieces, and are intended to receive the stem of the boat, and prevent it striking the wall when the fame is not flapped or hopped in proper time; a practice, however, for which the bye-laws or clauses in the act should provide adequate fines or punishments: and flapping poles should be let firmly into the ground in the proper places for the bargemen to wind their rope, or flap as they call it, and by easing it out by degrees, to flop the velocity of the boat before it arrives at the gates or breadth of the lock that it is entering. The gates should also be furnished with two or three strong upright planks on the lower side, &c., fig. 39, to receive occasional blows from the noes or items of the boats, and prevent the planks of the gates being broken or started thereby. There is room for the skill of the engineer to be exercised, in forming the lock-fills and gates to that particular angle which will render them stronger for the same width and depth of lock, than they would be if they met more acutely, or were shorter and met more obliquely. In very large and wide locks, the gates should not be straight or plane, but a little curving to give them greater strength. On narrow canals, it may not be necessary to make double or angle gates, but one gate slanting square across the lock may be strong enough to answer every purpose, and be opened more readily than two gates on the opposite banks can be: the upper gates in particular, on account of the comparative shallowness of the water there, may be fingle, while the lower gates, if the fall is considerable, may be double. In setting out canals, where the fall of the ground is very gradual and easy, it may be necessary to avoid long lengths of deep-cutting below, and of embankment above, or making the line very crooked, to make shallow locks, if water is plenty; and under the same circumstances only, will it be allowable to make 12, 12, or more feet locks in particular places, however well the ground may suit the fame; many of these double locks were at first erected, as on the old Birmingham canal, and the Calder and Hebble navigation, where about 18s. single locks were obliged to be subtiliated, to avoid the waste of water, before pointed out.

We have not yet noticed an inconvenience and waste of water, which attend the placing of locks nearer to each other than about 200 yards, or having basins between them, equal in area to about that length of the canal, as was done at Salter Hebble in 1753; in the alteration above mentioned; without which precaution, a boat in descending lets down more water than the pond below will hold, without raising its surface so as to leave a good deal over the lock-weirs, and fill and empty basins happen in ascending, for the short pens are so much lowered by filling the lock below, that laden boats are unable to proceed for want of water, until a supply is let down to waste through the upper lock, to help them forwards. As many locks as can conveniently be brought near to each other, on the principles above, and before explained, should be contrived, if it can be done, to be in sight of each other, and of a length of canal each way; and the lock-keeper's house should be so placed, that he can when at home at his meals, or otherwise, in bad weather, see barges approaching the locks, in time to meet them before they enter the locks. Mr. Fulton who wrote in 1769 says, that the coil of locks for 25 ton boats, was about 701. per foot rife, and for 40 ton boats, about 100l. per foot rife; this may serve to give some general idea of the cost of locks at that time; but we would observe, that the decrease of the value of money, and the exceptions to all general rules on these subjects are so many, no dependence ought to be placed on such modes of estimating. If sufficient water-way is given in the paddles, and there is sufficiency enough to draw both the paddles, and open and shut the gates at the same time, a boat may pass each lock of the usual construction and rife, in three minutes time, but in general, 5 or 6 minutes will be nearer to the average time lost at each lock, as observed by Mr. Beau on the Grand Junction canal. Theorem for the time of filling a lock of given dimensions, and with given paddles and fall of water, should be found and compared with many experiments on the locks under the care of our resident engineers. (See Nicholson's Journal 8vo. No. 9, vol. iv. p. 36.) It should be considered, that a boat going up lets down or consumes twice the weight thereof (boat and cargo included) in water, more than in going down through each lock; for the boat on entering the empty lock, expels as much water into the lower reach as its own draft of water, which is made good out of the upper pond when the boat enters the same; while a descending boat expels its own flotation bulk of water from the full lock into the upper pond, where it is retained on the slanting of the upper gates; the mean of a passage each way will be a lock-full for each boat, unless they go always loaded one way, and empty the other. Mr. Fulton says, that the consumption of 25 ton boats through eight feet locks, will in general be about 103 tons of water in ascending, and 103 tons in descending; and Mr. Chapman informs us, that boats passing and repassing a summit, laden one way, and returning empty, will require nearly 13 times the weight of their lading of water for their passage, out of the summit pound.
The saving of water in the use of locks is a consideration of so much importance in most of the canals which exist, that it is necessary we should mention several of the expedients which have at different times been proposed, or practised for that purpose. Some of the most obvious of these are, a minute attention to the fitting of the gates and paddles, constructing every part of them of the most feaoned and durable materials, with the utmost precautions against partial wear or liability to accidents, by which the gates or paddles would leak and waste the water; and should such leaks happen, the establishment for working the canal ought to be such, as to detect the same immediately, and apply the proper repair or amendments without delay. It is of great importance, to adapt the plan or surface of the water in the lock, to the size of the boat or boats that are to be used, leaving as little water uncovered in the chamber of a lock as possible, and for this purpose, where water is scarce, it will be necessary to enforce the regulations, that the act ought to contain for the length, width, and form of the boats that are to be used; and on canals for large and small boats, to see that two or more of the smaller boats are so contrived as to lie close together in the lock, and occupy the whole space thereof as one of the large boats would do: less than this number of small boats must not, when water is scarce, be allowed to pass, or without paying such increased tonnage or lock dues, as will act as a prohibition.

The "waiting for turn," particularly by empty or lightly laden boats, ought also to be provided for, and it may be necessary on some occasions to enforce the same; viz. to suffer no boat to pass down, until there is another arrived below, and ready to ascend as the lock is filled; or any boat to ascend, till another is ready above to descend with the same lock-full of water. Where small or short boats are in pretty general use upon a canal, as on the Stour and Severn, it may be right to adopt the practice which Mr. Thomas Telford has described, who says, "the locks are so formed as to admit of either one, three, or four boats pausing at a time, without the loss of any more water than what is just necessary to regulate the ascent or descent of the boat or boats that are then in the locks. This is accomplished by having gates that are drawn up and let down perpendicularly instead of being worked horizontally; and each lock has three gates, one of which divides the body of the lock, so as to admit of one, three, or four boats at a time." See Pyleley's Report before quoted, page 599.

A very sensible writer, who has given a full account of the Grand Junction canal, in the Agricultural Magazine for 1803, vol. viii., under the signature of a constant reader, suggetts at page 204, the propriety of an additional set of narrow locks on each side of the summit which is in want of water, for the use of the narrow boats, to which they should be exactly fitted; as also, to avoid the expense of lifting or pumping water, that can be collected in reservoirs or leaders at some distance below the summit level, by using shallow locks of only three or four feet rise each, between the summits and the points where such waters can be taken in without lifting. The pumping of water from a lower level to supply the want of lockage, by means of team engines, has been practised with success on the old Birmingham, the Bury, and several other canals; the Crown was to be constructed with a dependence on this mode of supply, as appears by its act; and on the Grand Junction, engines have lately been erected near Tins and near Braithwaite, for raising water to the summit-levels. A very considerable power is lost in the defcent of the water through the paddle- holes, to fill the lower part of a lock, and again through the gate paddles in emptying the upper part of the lock; we have often thought that it might be practicable to apply this power for returning a certain quantity of water into the upper pound, either by making the descending stream act on a wheel, or on vane like those of a screw-jack, or by means of hydrostatic pressure, or momentum machines. See Monthly Magazine, vol. vi. page 124.

Side-ponds are an expedient for retaining part of the water, from the upper part of a lock when it is to be emptied, and to use the same towards filling the lock again for the next boat: they are said to have been invented by M. Dubie, and one with 3 divisions was tried in a lock of 20 feet fall, on the canal of Tour, near 100 years ago; they are described by M. Belidor. On the 5th July, 1791, Mr. James Playfair took out a patent for this mode of saving water in using locks. See Reporty, vol. iii. 302. And in the same work, vol. i. p. 377, Mr. W. Pitt has described three side-ponds, in form of sectors of a circle. We read that in April last, (1805) an experiment was made on the Grand Junction canal, and two of these side-ponds, with earthen banks like a canal, and each about the same size as the lock, were tried near Berkhamsted; into one of them, whole bottom coincided with about half the height or altitude of the lock, the upper quarter of the water of the lock, for a descending boat, was drawn, and it was there retained by a close shuttle; the shuttle of the other side-pond, whole bottom was about level with one-fourth of the height of the lock, was then opened, and about another quarter of the water in the lock flowed into it, and was there retained by the shuttle; the remainder being emptied by the gates-shuttles into the lower canal; and the boat having pafted out, and another ascending one taken its place in the lock, the side-pond that had lain been filled was emptied into the lock, and then that also which had been first filled; these together filled half the lock, before the upper paddles were drawn to fill up the remainder, the shuttles of the side-ponds being first shut down; by this means, two boats were passed, by letting down only half a lock-full of water into the lower pound; and the lock remained full, ready for another descending boat, as before. The time taken up by the above operations was about nine minutes for each boat that passed, or 5½ minutes more than if the side-ponds had not been used.

We understand that side-ponds are becoming common on different canals; their construction offers a very curious exercise for the abilities and skill of the engineer, so to appor-
During the expense of construction, loss of time in felling, and the saving of water that is effected, the result may be the most advantageous.

It appears, that Mr. Michael Logain took out a patent in 1804, for raising or forcing water into a lock; also, that in January 1791, Mr. Joseph Brooks obtained a patent, for a method of raising the water in a lock, from a deep side-pond or well near a lock, and by that means filling the lock with water, until a barge had passed up, or another was ready in the lock to defend, when the water below being again let down, the watertide by the same commuting current that had brought it into the lock, it was again emptied, and the boat able to proceed on the lower canal, without having waisted or let down any water. See Repertory, vol. vii. p. 361.

Mr. Lawson Huddleston has communicated, through the medium of Nicholson's Journal, 8vo. vol. iv. p. 236, a method of raising the water in a lock, from a deep side-pond or well as above, by means of a solid or heavy plunger that can be let down into the well, by means of machinery that sustains it when the water is to be raised, and drawn up when it is to be allowed to sink again; the plunger being balanced in all its different degrees of immersion by a counter weight acting on a spiral or spiral curve.

Mr. Robert Salmon has invented a different mode of accomplishing the same thing; his plunger being hollow, and so buoyant as possible; and for forcing the same down into his cistern or side-pond, when the lock is to be filled with water, he has contrived a very curious apparatus; it consists of a very heavy carriage on four low wheels, or heavy rollers of metal, connected together by a frame to answer the same purpose. Two frames or planes are prepared, that turn on fixed centres, as a door does on its hinges, but horizontally instead of vertically; the other two ends of these planes rest on the two ends of the plunger, by means of uprights therefrom and moveable joints; upon these planes the carriage rolls, in such a manner, that when it is drawn forward, by means of a rope or other machinery, the weight advances upon the plunger, and the planes being at liberty to turn on their joints, it sinks the plunger by degrees, until at length the four wheels rest exactly over the joints at the ends of the plunger, centering the whole weight of the carriage and carriage, to keep it down and elevate the water in the lock; on the carriage being withdrawn, the weight on the plunger lefles, and it rises, until at length the four wheels rest just over the hinges or fixed joints, and no part of the weight of the carriage or wheels is then exerted upon, or to counteract the buoyancy of the plunger, and the water retreats from the lock into the space under the plunger. That this carriage, which must be extremely heavy for large locks, may not be subject to run forward or back on the planes; Mr. Salmon has contrived one of them with a peculiar curvature or bend, so that the tendency of the carriage is as great to advance as to retreat, in every part; and a constant and small weight, hung on the end of a line over a pulley, in the model, will cause it to move either way, with a regular and ready motion. During the last session of the Society of Arts, in the Adelphi, Mr. Salmon presented a model and description of his invention, for which he was honoured with a premium; the model is lodged in the Society's collection, for public inspection, and a particular description of the same is expected to appear in their next, or 23d volume of Transactions. Mr. Salmon has hit upon a method of mechanically constructing the curve above-mentioned for one of the planes, which is found to approach very nearly to the arc of a circle. A mathematical friend of Mr. Salmon, who was shown the model in an early stage of his experiments thereon, has proposed as the 36th question in Leyden's Mathematical Repository, the determination of the nature of the curve in a particular application of Mr. Salmon's principle; we are sorry, however, to see this question still unanswerable by the ingenious correspondents of that very useful and learned work; because this curve promises to be applicable on several occasions in the construction of hydraulica machines. We have been treating of various contrivances for saving water in the use of locks of the common construction; and we shall now proceed to mention severall substitutes for locks in overcoming obstructions on a canal or river, but in which the boat continues floating in water; before we proceed to inclined planes, or other schemes, in which the boat is to be drawn or suspended out of the water, or the goods to be removed by cranes, &c. to other boats.

Substitutes for locks, have been called for in some situations by the actual scarcity of water, in others by the previous and necessary appropriation of the whole of the streams to mills or the practice of irrigation, and not in a few cafes by the jealousy and opposition of mill, park, and land owners; the intertemporal zeal of some projectors may have operated, who do not hesitate to prognosticate the annihilation of lock-canales, by "improved science; in like manner as improvement in machinery renders the old apparatus useless." See R. Fulton's Transact., page 28 and 110, &c.; also, W. Chapman's Observations thereon, page 2, &c. Several canals have, like the Herfingan, been restricted from erecting locks in particular places, without the mill-owners' consent; it is therefore no matter of surprize, that various schemes have been proposed to obviate the necessity of common locks. On rivers where the boats are hauled up against the stream, it is not unusual to lighten a boat by shifting part of its cargo into other boats, called lightening boats, so that their diminished draft of water may enable them to be dragged over any particular rapid; and in more extreme cafes, the whole of the lading may be taken out, and be conveyed by land to meet the boat again after it has been dragged empty over the rapid. Rapidis may themselves often be made navigable by jetsies, or contraction of the width of the stream in such places, and if the fall is rendered very considerable thereby, capstans or machinery may be erected for the hauling up or emptying down of boats; these methods have doubtless been in use from the earliest periods; and we read of great numbers of men in China being employed with ropes to haul boats up their artificial rapid or falls. The methods of using float-planks occasionally to cause an artificial flood in Egypt, China, Thandra, and Ireland, as before-mentioned (when speaking of the invention of locks), are also very ancient, and such are still in use upon several of our rivers; on the Ivel river below Biggleswhite, we think we remember seeing upright narrow planks used against a moveable beam at top of the water, and a fixed fill at the bottom of the name, for penning the water and producing a flood or flood of water, when the planks are removed and a boat may be passed. On most of our old rivers navigation there are gates erected to pen the water, and the name are drawn up to occasion a sudden flood while a boat is to pass. At the entrance of the Worleymine on the Duke of Bridgewater's canal, we remember a large door that was drawn up for our boat to pass under it into the tunnel, and then let down to pen the water therein three or four inches higher than it flood in the canal. The difficulty of opening large gates, to produce a flood of water or to let a boat pass,
has been before noticed; and in the *Mémoires de l'Acad. des Sciences* for 1707, we find the description by *M. de la Hare* of gates calculated to obviate this inconvenience in part, by having a large pair of doors in the gates opening the contrary way, or with the stream, which, on the drawing of a pin can be let to open by the prefire of the water; after which the great gates can be opened with ease, and when opened, the doors can as readily be shut again and pinned, owing to their being in the direction of the stream; and the gates then are ready to be shut again as soon as the head of water is run off, or the boat has passed. It appears, that in extending the navigation of the Seine river in France, gates were introduced, which the Duke of Reuens had invented, and which are described in the *Mémoires de l'Acad. des Sciences* for 1669, consisting of two upright gates, rather wider than half, and as deep as the channel of the stream or river, hewn into the arc of a circle of about 48 feet radius; to each of these gates several long beams of wood were fixed, meeting in or near the centre of the circle, of which the gates formed a part; and here being firmly united, they abutted against a solid pier of stone, or worked on a centre-pin fixed in a strong pile, drove very firmly into the earth by the side of the channel, at 48 feet below the place where the gates were intended. A notch was formed in the bank of the channel on each side, in form of sectors of circles, sufficiently large to contain the two gates and their beams or centers as above. By this construction, the whole of the prefire of the gates when shut and the water penned by them, was brought to act on the two upright pins or centres; and a very moderate force applied to the head of each gate would draw them apart and into the sector-like receptacles prepared for them, leaving the channel or course of the stream perfectly free of any obstacle, to check either the current or a boat in passing through. By a small adjustment of the places of the centres, gates of this kind may at all times be made to fit close to each other in the centre of the channel, on its bottom, and also to the side walls of the channel above them, and yet on being moved a small space from each other they may clear those walls and be free to move into the receptacles, in the bottom of which there may be small rollers to carry the gates with less friction, or rollers under the gates may be used for the same purpose. See *Jacob Leupold's Theatrum Machinarum*, folio, published in 1726 at Leipzig.

Dr. James Anderson, of Edinburgh, has continued, and published in 1794, in his *General View of the Agriculture*, &c. of the County of Aberdeens, a method of elevating or depressing small boats, floating in a coffin or large tight open cafe full of water, that can at will be made to coincide and connect at one of its ends with either the upper or lower canal; into or from which the boats may pass without the loss of more water than is necessary to fill the narrow space between a draw-gate at the end of each canal and at the ends of the coffers, when the same is prefixed and retained close to the end of the canal, and a small additional quantity to restore the equilibrium and give motion to the coffers, of which there are two exactly of similar dimensions suspended and connected together by strong chains. *Mr. Chapman's concise description of this invention is so much to our purpose,* that we beg to use his words, who says, "the doctor there observes, that, for all the purposes of commerce, no more width of boat is requisite than four feet, or more than two or three feet depth; and that the length might be infinite, so as not to be inconvenient for ascending and descending between any two levels of canal, which he proposes to be done in the following manner, viz. that the lower level be Vol. VI."

On the 24th December, 1798, *Mr. James Foulis* took out a patent, (see *Repertory*, vol. i. p. 7.) for a method differing in principle from that of *Dr. Anderson* above described, only in having an axle and two wheels thereon, at a distance from each other on the middle pier, and under his coffers or receptacles, similar axles with a pair of wheels, and instead of his coffers or receptacles being suspended from the two ends of a chain passing over the wheel, as in *Dr. Anderson's method*, *Mr. Foulis's two chains are fixed to the tops of the side walls, passing under the wheels of his receptacles, and over the wheels and axle on the middle pier*. He also describes rollers or guides by the sides of his lock-pits to steady the receptacles, and a toothed wheel on the middle shaft or axle connected with a fly or brake wheel to regulate the motion of the chains and receptacles; he also provides the gates or hatches at the end of his receptacles, to be balanced by counterweights, and to draw down into a cavity prepared for the purpose, when a boat is to be passed in or out, instead of drawing up. And if the fall be very considerable, he suggests the propriety of a short tunnel or arch to conduct the lower canal into the lock-pit, instead of an open notch or perpendicular wall cut in the hill for the lower canal. It appears that this balance-lock of *Mr. Foulis's* was put in practice, or at least tried, on the *Donof* and *Somerfield* canal, near Frome, on the 6th of September, and 17th of October 1830, on a 21 feet fall, and with boats of ten tons burthen; delays in completing the above canal, and forming a communication with the sea, prevented this lock from being made use of for a long time afterwards, but we believe that the state of a late writer on the above experiments, found it was a subcription was set on foot in 1822, to raise money to make a lock in this very place, originated entirely in mistake.
the axis or barrel for the rope, to give motion to the ropes and cradles with their contents, when a sufficient quantity of water had been let into the upper chell by a valve and pipe contrived for the purpose, or out of either of the chells by means of a dring attached to their valves, till an equilibrium of the two chells, cradler, and boats upon them were obtained. By this apparatus it was proposed, that in general one boat should be ascending upon one of the planes while another descended on the other; but the cauliens were large enough to admit of sufficient water from the upper or lower level being taken into one of the chells, to balance a loaded boat on the other. The captain worked by men was proposed to be used, for dragging boats out of the upper canal over the upper plane and platform on to the cradle in order to descend. Walking-wheels, to be worked by men, were also proposed instead of water-wheels, where the water was very scarce in the upper canal. The canals above-mentioned were never carried into execution, although an act of parliament were obtained for the former, nor have we heard of any of Mr. Lead's planes being brought into actual use.

Mr. William Reynolds, of Ketley, in Shropshire, was the first who contrived and executed an inclined plane (which was completed in 1789) for the passage of boats and their cargoes, which was found fully to answer, and continued in practical use. Mr. Thomas Telford has thus described the fame, in Pliny's Agricultural Report of Shropshire, p. 291. Mr. Reynolds "having occasion to improve the mode of conveying iron-stone and coals from the neighbourhood of the Oakenshaw to the iron-works at Ketley, these materials lying generally at the distance of about a mile and a half from the iron-works, and at 73 feet above their level, he made a navigable canal," called the Ketley canal, "and instead of defending in the usual way, by lock, continued to bring the canal forward to an abrupt part of the bank, the skirts of which terminated on a level with the iron-works. At the top of this bank he built a small lock, and from the bottom of the lock, and down the face of the bank, he constructed an inclined plane, with a double iron railway. He then erected an upright framework of timber, in which, across the lock, was fixed a large wooden barrel; round this barrel a rope was passed, and was tied to a moveable frame; this half frame was formed of a size sufficient to receive a canal boat; these boats were 20 feet in length, 6 feet 4 inches wide, 3 feet 10 inches deep, and carried 8 tons; and the bottom upon which the boat rolled was preferred in nearly an horizontal position, by having two large wheels before and two small ones behind, varying as much in the diameters as the inclined plane varied from an horizontal plane. This frame was placed in the lock, the loaded boat was also brought from the upper canal into the lock, the lock-gates were shut, and on the water being drawn from the lock into a side-pond, the boat settled upon the horizontal wooden frame, and as the bottom of the lock was formed with nearly the same declivity as the inclined plane, upon the lower gates being opened, the frame with the boat passed down the iron railway on the inclined plane into the lower canal, which had been formed on a level with the Ketley iron-works, being a fall of 73 feet. Very little water was required to perform this operation, because the lock was formed of no greater depth than the upper canal, except the addition of such a declivity as was sufficient for the loaded boat to move out of the lock; and in dry seasons, by the assistance of a small steam engine, the whole of the water drawn off from the lock was returned into the upper canal, by means of a short pump. A double railway having been laid upon the inclined plane, the loaded boat in passing down brought up another boat, containing a load nearly equal to one-third part of that which passed down. The velocities of the boats were regulated by a brake acting upon a large wheel, placed upon the axis, on which these ropes connected with the carriage were coiled." It appears that this plane has an inclination of about 22°, except near the extremities, where it diminishes to about 11°; and that about 400 tons of coals usually descend thereon daily. In 1789 a copper medal, or halfpenny, having a representation of this plane on one side, and of the cast-iron bridge at Coalbrook-dale on the other, was struck, and issued by the Coalbrook-dale company. Since the practicability of inclined planes has been established, by the success of the Ketley plane, but few acts have been passed for new canals, without a clause authorizing the company to erect inclined planes, instead of locks, if they should be found most advisable. Before proceeding to mention the inclined planes of different constructions, which have been since made or proposed, we shall notice the under-ground plane at Walkden Moor, which was completed in October 1797, upon Bridgegewater's canal, it being so similar to the Ketley plane above described.

The Duke of Bridgewater, in the year 1800, caused an account to be presented to the Society of Arts, in the Adelphi, London, of the inclined plane which he had erected and brought into use, under the direction of his agent, Mr. Benjamin Balthers, between two different levels of his tunnels or subterraneous canals from Worlehy near Manchester; for which the Society voted his grace their gold medal, and published plans and sections, and an account thereof, in their 18th volume of Translations; to which we refer, only mentioning, that this plane, which is 35 1/2 yards high, and 121 yards long, through an inclining tunnel hewn in the solid rock, at near 60 yards below the surface of the ground, differs from the Ketley plane, in having, upon 57 yards of the lower end of the plane, a single railway only, to or from which the two railways above join by cary curves, to proceed up to the locks by one railway, or down by the other. A winch and pinion are provided, to be occasionally worked by two men, into cogs in the large brake wheel, for lifting the boats in motion. Rollers are placed between the iron rails, for the slack part of the great ropes to run upon, and for further preventing the wear of these ropes, they are lapped round with a small cord. About 12 tons of coals are let down in each boat, and a boat and cradle on which it runs, weigh about 9 tons more. About 16 minutes is consumed in palling a pair of boats: the boat-crades are 30 feet long and 1 1/2 feet wide, moving on 4 iron rollers. A small bell gives notice from the bottom to the top of the plane, when the boats are placed on the cradles, and the machine ready to work. The water of the locks is let down by a paddle, through a perpendicular shaft, to the middle canal, and acts as a water-bellows to force fresh air down into the extensive tunnels and works that are on the lower level. The upper gates of the locks turn in hollow grooves like a common lock, but the lower gates draw up in grooves, by means of windlasses, to let the boats pass out or in when the water is let off.

Mr. William Reynolds has the honour of introducing another fort of inclined planes, on the Shropshire canal, where there are three planes in use of 120, 126, and 277 feet rises! The act for this canal palled in 1788, and it was completed, under the direction of Mr. Henry Williams, as refit engineer, and opened in 1792. These planes are upon the same construction as those at Ketley, except that there are no locks at the top of the descending planes, but the same are continued above the surface of the water in the upper canal, and terminate in a crose beam, from which another plane and rail-way descend into the upper canal: this is for avoiding
avoiding the waste of water which looks at the top of the plane or sluice. A small steam engine is used for working the axis of the rope barrel, at some distance from which, on the upper side, there is a large pulley or wheel, fixed at a proper height, for the great rope to pass over, to draw the boats up or let them down the long descending plane; another smaller axis and rope placed are provided, which can, like the larger one, be call in or out of the engine-geer at pleasure; this last is used for hauling the boats up the short ascending plane, from the upper canal. The engine can also be used to draw empty boats occasionally up the long plane, in case such want to pass, when there are no loaded ones ready to descend, and draw them up, as we have before described. The wheels or rollers under the cradles appear on these planes to be equal in diameter, and not of different sizes, so as to bring the two ends of the boat to a level, as on the Kelpy; they do not, therefore, appear applicable to very steep planes or to long boats. On the windmill plane, which is 1,000 yards in length, and 126 feet high, its boats have been passed down, and fix taken up within the hour, the steam-engine and three men only being employed: the boats here are of the same length and breadth as on the Kelpy, but shallower, so as to carry but few tons; and such boats are said to be passed down these planes for three pence each, and the empty boat taken up gratis. At Wombrook on the Shrewsbury canal, Mr. Thomas Telford has since erected a plane, 223 yards in length, and 75 feet high, exactly on the same construction as the above, of which an account, with plans and sections, may be seen in Pym-ley's Report, p. 294.

On the 19th of June, 1793, Mr. Jofhua Green took out a patent for the use of double inclined planes and rail-ways, on which cradles for the boats are to be used, consisting of a frame of wood, and the bottom corded by strong ropes across each other like the common bedsteads, that the boat may not be strained; in order to introduce wheels of four feet diameter for the cradle to move upon, a strong frame is to surround the cradle, and be firmly bolted to it, but leaving an interval sufficient for the four or more wheels to move between it and the cradle, by which the axles can be fixed to the wheel, and work in guides at each end, with less friction than common wheels or rollers. To his brake-wheel handlespokes are adapted, for men to affix in setting the machine in motion, instead of a winch as before described on Bridge-water's; the ropes are to be capable of adjusting to the proper length as they stretch or contract, by a screw or otherwise. A third inclined plane is directed to be made, for the purpose of carrying a counter weight or vessel, whose rope is to pass over another axis with a brake and handle spoke wheel, for hauling the cradles and boats out of the upper level to the ridge or crofs beam, or to cafe them down into the same. He recommends spare vessels laden with water to be in readiness to pass up or down the opposite plane, as a counterpoise to any single loaded boat that may arrive at the plane. Alfo that single planes, and with less inclination, may in some instances be adopted. See Reper-tery, vol. v. p. 11.

Earl Stanhope, in the year 1793, in recommending the Bude and Hatherleigh canal, proposed, between the different ponds or water-levels of the intended canal, to have iron rail-roads of gradual and easy ascent, on which boats of two tons were to be used, suspended between a pair of wheels of about 6 feet diameter, and to be drawn up or let down the fame by a horse, in order to be launched in the upper or lower water-level, or canal.

On the 8th of May, 1794, Mr. Robert Fulton obtained a patent for the use of a double inclined plane, wherein cradles having giffons or califons under them, so very differ-ent from Mr. Leech's above describ'd, except that the boats were in some cases to be taken on to the cradle planes or cogges instead of length ways; that was propelled to be accomplished by short inclined planes, on which the boats, when upon wheel carriages, were to be drawn out of the upper, and lower canals by means of ropes working on the sides of water-wheels; a brake is to be used for regulating the motion of the boats and cradles, when brought nearly to an equilibrium by the valves; brace-blocks, or pulleys, to be used for shortening or lengthening the large ropes, when necessary. See Repertory, vol. vii. p. 222.

Mr. William Chapman, at page 59, of his Observations, which were written principally in relation to Mr. Fulton's treatise, fuggles this false enunciation of inventions on inclined planes, as before-mentioned, not knowing, as we apprehend, of Mr. Fulton's patent above-mentioned, because it was not published till 1797; and it is indeed singular, that Mr. F. Shoulb, in 1795, have written 114 quarto pages on the subject of canals, and not once have given a hint of his having taken out a paten in the year before for none of the principles therein explained, and so highly recommended, nor does his long letter in the Star News- paper of the 39th of July 1795, announcing this work being in the printer's hands, make the laft reference to his patent. The Board of Agriculture muff, we are confident, have been equally in the dark, in March 1796, or they would not have given Mr. R. the opportunity of putting into notice, a subject wherein he was a patentee through their means. We beg here to remark, that our duty, in treating this part of our subject, seems to require the mention of all the inventions and methods which have come to our knowl-edge; and though we should have more pleasure in making known the inventions of those who lay the fame at once open to the community, yet, as all of these will be in a few years, we have not thought it right to exclude or be less particular in the mention of, inventions or contrivances so circumstanced: but to give the dates of such patents wherever we could, that their termination (at the end of 14 years) may be known.

Mr. Robert Fulton, in his 410. work, entitled "Treatise on the improvement of Canal Navigation," published in London in 1796, with many plates, has propofed the use of narrow canals and inclined planes, on which small and shallow rectangular boats are to be used, having low wheels, or rather tracks fixed underneath their bottoms; he propofes to have on his double inclined planes, an endless chain passing up the track of one plane and down the other, round or over wheels that are of the proper size and fixed in proper places and directions at top and bottom of the planes to suit the swag or curvature of the leading chain; these are made to revolve at pleasure, with power sufficient to drag a loaded boat up one of the planes, (by means of a short double chain belonging to the boat which is to be hooked into, and will at the proper time discharge itself from the leading chain), by means of toothed gee attached to the upper wheel, on which there are flubs to prevent the chain from flipping; which connect with a water-tub depending in a perpendicular shaft, discharging itself at bottom by means of a valve, and returning again to the top, when call out of gear, by means of its counter weight, balance-chains, and fly, ready to be again charged with water from the upper canal. The motion of the whole is regulated by a pair of fanners or an expanding fly; a smaller axle and cog wheel are provided, working into the tub-shaft gear, when necessary to draw the boats up a short plane that descends into the upper canal, on to a bridge or curving
C A N A L.

This page describes a system for propelling boats through a canal, using a mine-engine. The page mentions the use of inclined planes for raising and lowering boats, and describes how to balance the loads on these planes. Mr. Fulton is credited with inventing the system, and the page includes diagrams showing the process. The text is replete with technical terms and descriptions of the mechanics involved in the system.
water to fill the cradle, making it act as the chamber of a lock; the lock-gate being opened, a boat might enter the cradle, from which it would expel great part of the water into the upper canal again, if the boat and cradle were nicely adapted to each other; the lock-gate and baffle should be again shut, when the water might be drawn off into a cistern, (to be returned if necessary by a water-wheel or any of the methods before mentioned), the cradle be unfastened from the lock, and be let down the plane by any of the regulators before proposed. For pausing the boat out of this cradle at the bottom of the plane, the back or other end of the cradle might open, or, perhaps a better method would be to continue the plane deep enough into the lower canal, that the cradle, which should in this case be heavy enough to sink in water, might defend low enough for the boat to float out or in, over its end; side rails should, in this case, stand up from the cradle, to draw its place when under water, and for guiding and fixing the boat over it, with liberty to sink into the cradle, as it is drawn up the plane to the surface of the water.

Mr. Chapman informs us (page 7), that for avoiding the friction of the gudgeons of rollers, when charged with the weight of a loaded boat on an inclined plane, Earl Stanhope has proposed, that rollers between the boat's bottom and a smooth plane should be used, moving or rolling with the boat, for half the boat's length; the rollers then to return to their places by means of weights acting over pulleys, and connected by a chain to the ends of each roller. Mr. Fulton, he says, proposes to use moving rollers, attached to, or going under and through the cradle that contains the boat, the gudgeons at the ends of the several rollers being paffed through the links of an endless chain or collar, by which the rollers are returned in a cavity under the boat, that is rolling in the cradle; this endless chain of moveable rollers for lowering of friction, appears to be claimed as part of A. G. Eebehart's patent of the 31st of January, 1795, for various machinery; see Repertory, vol. ii. p. 305.

The principles of setting out canals, where inclined planes are to be used, are similar to those we have explained, in recommending several locks to be brought together to form a part of such, or a considerable fall in one place; it will, however, be necessary, in determining the place for an inclined plane, to choose ground which slopes as regularly as possible between the intended upper and lower levels; if any part of the ground for the intended plane is springy and disposed to slip, the springs must be cut off by effectual and durable underdrains. It will be better to contrive the plane, if practicable, that little, if any, filling up of hollows shall be necessary in forming the plane, to avoid new made ground, which on a considerable declivity would perhaps slip, after heavy rains had faturated it with water; the foundations for the floes or bearers must also be carried through such newly made ground, and into the firm-fll. The staff which is removed in forming an inclined plane, should be carefully levelled, or disposed of in holes, so as not to form spoil-banks, and be covered with the top soil previously taken from those places. In case a perpendicular shaft and fough thereto is wanted at the head of the plane, the knowledge of the strata, or matter which compose the hill, may be of considerable importance, in determining the best place for the mouth of the fough; which may not always be the neareast point at the proper level, to the intended shaft, if the strata or measures of the hill are various and dip considerably. The plane being formed of a sufficient width on the ground, a strong framing of timber braced across may be used, if good and durable hewn flone is not in plenty, fixed firmly down to a sufficient number of piles drove into the ground, the interfaces between the framing being filled with good rubble flone, or gravel rammed very tight down. On these frames two or four fil or rails of sound oak, according as the plane is to be single or double, should be laid parallel and at the proper distances from each other, and firmly bolted down; and on these the slips or ribs of iron are to be evenly and smoothly fixed, for the wheels of the boat, or boat-cradle to run upon, and upon which they are to be confined from getting off sideways, by a rib flanding up for that purpose, either upon the wheels or on the rails. If good flone is in plenty, it will be proper to cover the whole of the plane with ashlar or well jointed flones, taking care that the courses across the plane at proper intervals are formed of large flones let some distance into and firmly bedded in the ground; and to the rear the cast-iron rails (that are used on good and durable planes) may be fastened by pins called into a hole with lead. Or, if wooden rails are to be used instead of cast-iron ones, strong planks of wood should be worked into the paving of the plane at proper intervals, on which to roll and fall down the rails.

Care should be taken, in all works of this kind, where large or heavy flones are used, to let no part of the mortises or holes which are cut in such flones remain open or united with lead or cement, to prevent the rain filling them with water, which would in winter time expand with the frost, and in mott illiances split the flone. It is unnecessary for us to point out to experienced engineers, the great care and precaution which ought to be used in works of this nature, to make every thing substantial and more than sufficient to sustain all the weight or strain to which it will be subjected, and which ought in mott cases, particularly the moving parts, to be previously calculated, and before the apparatus is put together for actual use, every rope, chain, framing, wheel, &c. &c. should be subjected to a greater strain than can occur in practice, to avoid the unpleasant, and perhaps fatal accidents, which might otherwise happen, by which a prejudice might at the onset be excited against the scheme, to powerful as to cause it to be laid aside without proper trial. It would much exceed our limits to enter fully into this subject, we shall therefore proceed to those other considerations for overcoming acent on canals, where boats have been lifted out of the water, or proposed to be, by a perpendicular acent; after which, there will still remain to describe the methods which require the shifting of the cargoes of boats into other boats, or to railway wagons, &c.; first mentioning that on the Shropshire canal, an inclined plane is used for pausing the boats over part of the acent, while the lock is opened for the other parts; and Mr. William Chapman, at pages 54 and 59 of his Observations, &c. recommends whenever coals in large quantities, lime, lime-flone, or other minerals, are to be conveyed along canals, or are brought in by branch canals on a small scale, there being a quantity of water which refloors cannot remedy, where it can be done in setting out the canal, in addition to the locks, to overlap the levels in a steep place, and communicate by an inclined plane for boats (or a double rail-way for tram-wagons) leaving the lock communication to answer all the general purposes of commerce. The same author observes, that the portage of articles from one level to another, and carriage of the boat itself is still practised in various parts of North America, as the falls of the Mohawk, from the Mohawk to Wood Creek, at the falls of Orangina, &c.; also at several places called Tarbets, in the Highlands of Scotland, as in Cantyre, Loch Lomond, Arrcharach and Long, Jur, &c. Among the principal inclined planes for boats, are those of Hay, Windmill-hill, and Wrockardine-wood on the Shropshire canal, Walkden Moor on Bridgewater's, Ketley on the Ketley, Wormbridge on the Shropshire, &c.

On the 8th of May, 1794, Mr. Robert Fulton took out a patent
patent, as before-mentioned, in which he describes (see Reportroy, vol. vii. p. 227.) either a rectangular upright notch in the steep face of a hill, to the top and bottom of which the two levels of a canal are brought, or a large perpendicular shaft and tunnel at the bottom for the lower canal, through which notch or shaft boats are to be drawn up or let down, in a pair of water-tight cradles, suspended at the two ends of strong ropes of chains, that are to pass over pulleys fixed above the top of the shaft, and connecting with a brake-lever or wheel, to regulate the descent of a boat in one cradle, and of another in the other, after they have been brought to an equilibrium by the letting out or in of water by proper values. The boats are to be drawn into and out of the cradles, by short inclined planes, in the upper and lower canal, on which the boats on water-tight carriages are to be drawn by ropes winding on the axis of water-wheels, to be turned by water let out of the upper canal thereon; brace-blocks are to be used for adjusting the length of the great rope, and capstans may be used instead of water-wheels, for pawling the boats on and off the cradles.

Mr. Fulton, in plates 11 and 12 of his "Tractate on Canal Navigation," and his description thereof (pages 97 and 105) has more fully described this method; and proposes for a descending trade, that the full boats should draw up the empty ones, and instead of inclined planes for getting the boats on to the cradles, a cage of iron should be used, into which the boats on the lower canal can be floated; and for discharging them into the upper canal, he proposes two lock-carriges, or large water-tight boxes, open at one end, moving on iron rail-ways, and which can be advanced by rakes and pinions over the shafts, while the boat is suspended high enough to clear its bottom; the open end of this lock-carridge is made to fit, and be retained against the frame of a lock-gate at the end of the upper canal, (as in Dr. Anderson's and Fufell's methods, and the water-tight cradle which we have lately mentioned), when the water being admitted by a valve, to float the boat in the lock-carridge, to the level of the upper canal, the lock or draw-gate thereof is to be opened, and the boat floated out of the cage to proceed on the upper canal; to the pulleys or drum-wheel over which the chains act, a fly or fanke is proposed to be connected to regulate the motion; as also an axis with cranks to work pumps, by which the water that is drawn off again from the lock-carridge into a fixed reservoir may be pumped up again into the upper canal, that no water may be lost. For an alternate trade, to which it may be at will adapted, or the necessary parts applied afterwards, an additional shaft must be sunk, in which a water-tub is to be suspended, instead of another cage and boat, as a preponderating weight; this is to be filled out of the water received in a cistern that is drawn out of the sliding lock-carridge.

Mr. Robert Fulton (see his "Observations," p. 94, and plates 9 and 10), particularly describes a species of Cranes, by which boats are intended to be drawn up, in an iron cage, through an upright notch or shaft, and by the motion of the jibs, are to be moved over the upper canal and lowered down to float therein, or the reverse in descending; for this purpose a perpendicular notch or shaft for the boats, and another for a water-tub, as a counter-acting and motive force, is to be provided; a reservoir is to be formed by the side of, and about 5 feet from the bottom of the tub-shaft, into which the water is discharged from the tub, when at the top, can be conveyed by a proper valve and spout; provision is to be made, by valves and spouts, for filling the tub from the upper or lower level of the canal, as occasion may require; and a valve is to be provided, opening by a pin in its bottom, for discharging the water when it rests on the bottom of the tub-shaft; over the tub-shaft a drum is to be fixed, for the tub-chains and crane-chains to wind round, and to this drum a fly or forner is to connect by toothed wheels and axles, to regulate the velocity of the motion. The crane-chains are to be double, and proceed to two separate jibs fixed on centres, at proper distances from each other, having the ends of their jibs connected by a coupling rod of the same length, by which they will always move parallel, and suit the distance of the hooks on the top of the iron boat-cage. For raising a boat out of the upper canal, the same being floated on to the cage suspended from the cranes or jibs, and the water-tub (to which balance-chains are to be adapted) being near the bottom, water is to be drawn, by a valve and spout, out of the reservoir into the tub, till it preponderates and draws the cage and boat out of the upper pound; the jib is then to be moved over the boat-shaft, and the water emptied from the tub by sufferance it to descend a little further and strike the bottom, when the boat will be lowered easily, by means of the fly, to the lower canal, where it can be floated out of the cage; and the reverse on ascending. If water is very scarce in the upper canal, and a fough or tunnel can readily be driven, for emptying the tub-shaft, the same may be made deep enough to draw water from the lower instead of the upper canal, for the preponderating power. We have not heard that any of these perpendicular lifts for boats have been executed, we shall therefore proceed to the other kinds of cranes and perpendicular lifts for the cargoes of boats.

Mr. Bridge, of Tewksbury, about the year 1759, contrived, for the navigation on Stroudwater river, a kind of cranes, with double jibs, that could be either used singly or together, and act as a balance to each other; these were erected on a strong walled bank, that separated the upper and lower levels of the river at the several mills. The boats to be used on each different level, or mill-stream and dam, were all of one size, and made exactly to suit and contain a certain number of strong wooden boxes, without any loft space. The goods or lading of the boats were placed in these boxes, and when they arrived at the first crane, one end of the chain thereof was hooked to a box, while the other was hooked to a similar box of goods in the other level, and by a peculiar structure of the crane, worked by two men at windlasses, both boxes were drawn up and suspended, somewhat higher than the bank of the upper canal, when the jibs were turned half round, and the boxes of goods were lowered down and replaced each other in the boats; the same operation was repeated with each of the remaining boxes, when each boat was ready to proceed with its new lading upon its own level to the next cranes. It can hardly be necessary to add, that the expence and delay of this method caused it to be soon laid aside.

Mr. Edmund Leach, in his tractate before quoted, proposed boats to be unladen and laden with boxes of goods as above, but to work the cranes by water-wheels, or by wheels for men to walk in.

The duke of Bridgewater's tunnel from his canal into the coal-works at Worsley, after it had proceeded for a great way fraught into the hill, came at a great depth to be under a small brook or confluent stream of water, by the side of which a large water-shaft was sunk, and a drum and large brake-wheel erected over it, of sufficient size that a man who stands before the lever thereof has his two hands at liberty to pull the lines which connect with the valves, and give signals to those below, while by lunging, or dipping accordingly, with his breast against the lever, he can in an instant stop the machinery in any part of its motion, or regulate the same at pleasure. There are two water tubs, which are very large, and have a valve and pin to empty themselves quickly when they arrive at the bottom; they are suspended by large ropes
or cables from the drum, while other large ropes descend from one to another, or coal shaft, by the side of the middle or principal tunnel, into and over the navigable tunnel, which there is at, we believe, 60 yards lower level. On this lower canal boats are used, similar in their dimensions to those above, and containing boxes, which being filled with coal at the several terminations of this canal, in the banks of coals; the boats are pulled along by means of ropes that are fixed at the ends of the tunnel, at the proper height for a man, who walks on the top of the coals, to lay hold of, and shove the boat along by. The boat being arrived under the coal-shaft, and one of the water-tubs being at the top of its shaft, the coal-ropes answering thereto is hooked on to the box of coals, and the defect of the water-tub, immediately from the opening of a hall, drawing the fdace to the bank of the principal canal, where being drawn aside over an empty boat, it is lowered into the same by a short lever or balance of the motion of the machine; when the interval of emptying the tub at the bottom by its valve, gives time for hooking another box to the other rope which is at the bottom, when the other water tub is filled, and the machine suffered to move, by the man who leams against the brake. This very complete and economic machine was contrived and erected by Mr. James Brindley, and it is so constructed, that when coals are not drawing, the alternate defect of the water-tubs work some very large pumps, which are sufficient to lift all the mine-water of the lower level into the middle canal and keep the lower canal always at the proper height for navigation.

The same tunnel of Bridgewater's canal being continued a great way farther into Worsley hill, till under Walkden moor, another subterraneous canal or tunnel there begins, at 35½ yards higher level, this last being near 60 yards from the surface; from the surface two shafts were sunk, one terminating in and over the upper tunnel or canal, and the other in and over the middle or principal canal; there is another canal still lower, which we have been left speaking of, after passing close by the canal above: between these shafts a large drum was erected on the surface, with a brake wheel and a pair of strong ropes. Two boats being arrived at the shafts on the upper canal, one of them loaded with boxes of lime-stone, that was wanted at the surface, and another with boxes of coals intended to be transferred into an empty boat in the middle canal; the ends of the two ropes were fastened to a box of coals and a box of lime-stone, when the superior size and weight of the coal-boxes drew the lime-stone to the surface, to be there handed to and the box; at the same time that the box of coal was deposited in the lower boat, ready to proceed on the canal to Manchester or other places. This method was in 1797 superseded by an inclined-plane for letting down the boats laden with coal, from the higher to the middle level, and returning the empty boats and boxes, as we have before-mentioned. At Brierley-hill, near Coalbrookdale, the extremity of a branch of the Shropshire canal, great quantities of coal and iron in crates made of iron were let down one of two shafts, which connected, with the termination of the canal above and the ends of a railway in a tunnel below, from which lime-stone in similar crates was drawn up the other shaft to be placed in the boat; a large barrel and brake-wheel were fixed between the tops of the shafts, and crates with jibs, by which the crates could be raised and moved over the shaft, or the reverse; these shafts, which were 120 feet deep, were not found to answer, in point of expense, so well as inclined planes, and Mr. Telford informs us (Plymley's Report, p. 306 and 307.) that inclined planes have been substituted, on which crates of coal, or iron pigs, or goods, descend and draw up other crates containing lime-stone, for the use of the iron-works above, by means of ropes, a drum, and brake-wheel, with a much less portion of manual labour, and more expence than was done by the shafts above-mentioned. For Liddick's lime-works, on Donnington Wood canal, similar shafts were erected, but are not superseded by an inclined plane. At Congoleaux, on the Sceneryhill Coal-canal, after the trial of Mr. Wilson's diving canal, inclined planes for descend ing boxes of coal were tried, and elected for some years; but the delay and expense were found to be great, that the economy effected the purchase of home mills, and under a new act of parliament, erected a large place of these inclined planes. Having inclined with the different kinds of inclined planes, by other ways of procuring the ascent of boats or their cargoe, we proceed to those which are used for overcoming the principal or sudden ascents on railways or tram roads; wherein wagons or cramps are used for the conveyance of goods, the same being drawn on the level parts or easy ascents or descents by a horse, as we shall describe shortly.

Mr. John Buddle, in the General Magazine for 1764, page 283, has given a view and description of the coal-wagon which had been then long in use on the wooden railways in the neigbourhood of Newcastle upon Tyne. This wagon moved on four wheels of cast-iron, or of wood with iron rims, having an edge standing up on the rim of each wheel, in order to guide and keep them upon the wooden rails. The wagon is in shape of an inverted prismatic, having a door or false bottom hung with hinges and fastened by a hasp, that can be let go to let out the coals when the wagon has arrived on the faith, and over the front which is to convey the coals into the ships or keels, or into a heap below as a slope; obliquely over one of the hind wheels a strong crooked lever of wood is fixed and suspended, by a strap when not in action; this lever, called a convey, is intended to act as a brake, by being let down upon the wheel when the wagon is descending down an inclined-plane, or steep part of the railway called a run; and on these occasions the horse is unharnessed from the front of the wagon and tied behind, and the wagon-man mounts allride on the hinder end of the convey, the fore-end being confined closely in a flap in the side of a wagon; and, by means of a pole that there is for his feet at the tail of the wagon, he applies just so much of his weight upon the convey as will either float the wagon or give it the proper velocity in every part of its descent down the hill or run: see the Agricultural Magazine, vol. iii. p. 241. In the year 1763, we remember seeing an inclined plane or wagon-way as above described, on which the coal-waggons descended down the hill from Wibsey-back to the town of Bradford, which is on a branch of the Leeds and Liverpool canal, their velocity being regulated by conveyways as above. But some waggons which we have seen, had the convey fixed to a moveable joint at the front of the wagon, and had a large block of wood behind, which, when the convey was set down, wedged in between the face and hind wheels, and acted most securely as a brake for stopping or regulating the velocity of descent. The empty waggons were drawn up the hill again to the coal-pits by a horse.

An inclined plane for waggons, was erected some years ago by Mr. Barnet, a coal-viewer at Bywell, near the Tyne river, of which a description is given in the Agricultural Magazine, vol. iii. p. 367, as follows: "It is a very ingenious, yet simple combination of machinery, for the purpose of regulating the conveyance of waggons laden with coals down an inclined plane, and for bringing the empty ones back again, by the same power that refixed its impetus in the descent. The length of the railway in which the waggons
gons run is about 864 yards, which distance it descends in two minutes and an half, and re-ascends in the same space of time; so that the loaded waggons can be let down with ease and safety, the coal discharged and the empty waggons returned to the pit within the compass of seven minutes. The impelling and retarding power of motion are derived from a plummet of 16½ cwt., which the waggons in descending and ascending alternately raise and lower to the depth of 144 yards. The rope, by which the waggons are impelled and accelerated, winds round the axis of a large wheel in a niche or groove in the middle, which gives the rope only space to coil round upon itself, and thereby guards against all possibility of entanglement. Near to the axis of the large coiling-wheel, there is an oblique indentation (a range of teeth or coggs) of call-iron, which corresponds with and works into a similar conformation on the rim of a smaller wheel; round which the plummet-rope is coiled or warped, and it is in consequence thereof moved round, only once in six rotations of the fulpinping and retreating wheel, which is the same proportion that the elevation of the plummet weight bears to the descent of the waggons, or to the rope from injury by dragging on the ground, rollers with iron pivots and brass sockets for it to roll upon, are elevated in the middle of the rail-way, but sufficiently low to prove no obstruction to the waggons which pass over them." On shorter inclined planes than the above, horse-gins are sometimes used, for drawing loaded waggons up, and at the same time letting empty waggons down the planes.

The construct of Rail-ways, or, as they are often called, tram, dram, or waggon-roads, requires the application of principles so exactly similar, and they are so intimately blended with our several navigable canal and river establishments, that we have before mentioned our idea of the impropriety and difficulty of separating them by deferring the account thereof to a future place in our work: the subject of inclined planes, of which we have hitherto been treating, has required the mention of so much relating to rail-ways, that we beg to proceed with and finish that part of our subject, before we resume the subject of bridges, towing-paths, fences, drains, boats, moving boats, &c. which yet remain to be mentioned. From the first opening of the coal-mines on the banks of the Tyne river above Newcastle, until about the year 1680, it appears, that the coals were conveyed in carts and wains, from the mouths of the several pits, to the keels or vellas, that conveyed them to the sides of the ship lying below the bridge. As this kind of fuel came to be substituted for wood in London and other cities, and towns on the south and eastern parts of the island, the consumption of Newcastle coals became so considerable, that we are told, that several coal-mines, as the Kinton, Benwell, Jemmond, &c. gave employment to 400 or 500 carts or other carriages each, for conveying the produce of those pits to the water-side; for the difficulty and expense of maintaining so many horses, and cost of repairing roads for such considerable traffic, occasioned the introduction, about the period above mentioned, of waggons-roads or wooden rail-ways, on which waggons of a large size, with wheels of a particular form to suit the rails, were used, and which one horse could draw, owing to the regular and easy descent with which the rails were laid. It was not until the year 1738 that this important improvement was introduced at the White-haven collieries on the western coast, and it is truly surprising to observe how slow the introduction of them was in other parts.

Way-leaves or slips of ground were let out and hired on leaves, or purchased by the different coal-owners of the several proprietors of lands, lying between their pits and the river, and this, not by the nearest route, but in such a direction as gave the most easy and regular descent. The inequalities of this fip of ground were levelled as a road, hollows were filled up, and huddled hills lowered, when sleepers or large logs of wood were laid across the same, their tops being all of a regular height; upon these, two rails, generally of beech wood, were laid parallel to each other, their ends abutting close to each other, and were firmly pegged down to the sleepers. The tops of the rails were planed smooth and round; the wheels of the waggons were low and of call-iron, or of solid wood with iron rims, which were not flat on the edge, but hollow to receive and move on the wooden rails; the inside edge of each wheel projecting near two inches, in order to confine the wheels effectually to the rails, and prevent the waggons from being drawn off the road. From all considerable works, there was a main way made for the passage of loaded coal-waggons as above; and another, or by-way by its side, for the return of the empty waggons. When coal-mines had been worked into deeper ground, and pits or shafts were opened below Tynedale, the rail-ways therefrom were conducted to the top of a range or wooden building called a flat, on the wharf or key where the ships lay; and the coal-waggons, a description of which we have already given, were either emptied at once through the spouts into the hold of the ship, or deploited in the warehouse below in store for future ships. One indifferent horse could in general draw three tons of coals from the pits to the river side upon these wooden rail-ways; which mode of conveyance became further improved by the introduction of plates of wrought iron nailed on to the rails for the waggons-wheels to run upon. Attempts were made in different parts, to introduce call-iron instead of wooden rails; but owing to the brittleness of the material, and the great weight of the waggons in use, they did not in general succeed.

About the year 1768, Mr. Richard Lovell Edgeworth contrived a remedy for the principal objection to coal iron-rails, in making use of two or three smaller waggons linked together, instead of one large one; a model of three of these he presented to the Society of Arts in the Adelphi, London, and was honoured by the premium of their gold medal. In the year 1788, the same gentleman, on some temporary wooden rail-ways for manuring of land, made several experiments, in the presence of different Mechanics, on the application of friction-rollers for diminishing the friction of waggons axles. The rail-ways hitherto constructed were private property, or for the accommodation of particular mines or works, and it was not, we believe, until about the year 1794, that Mr. Samuel Honfrey, and others, obtained an act of parliament for constructing an iron tram-road, tram-road, or rail-way, between Cardiff and Merthyr Tydrell in South Wales, that should be free for any persons to use, with drams or trams of the specified construction, on paying certain tonnage or rates per mile to the proprietors. Soon after the year 1797, iron rail-ways began to be constructed as branches to the canals of Shropshire; and, in other parts of England, Mr. Benjamin Outram, an engineer, began to construct the same upon improved principles, of which Dr. Anderdon has given an account in his Recreations, vol. iv. pages 169 and 473.

On the 25th of June 1769, the house of commons made a standing order for extending to all bills for making any ways or roads, commonly called rail-ways, or tram-roads, all the orders (of May 7, 1794) relating to the introduction of canal bills. One principal difficulty, the provision of water, does not here occur, unless for docks or basins, which are not frequently necessary, at the termination of a rail-way, at a river, or existing canal; and, as the owners of streams of water are not under dread of losing the fame by the passage of
of a rail-way near them, and the same is applicable to much more easily to the uses of the owners and occupiers, than a canals is, less difficulties will attend the obtaining of general power for making side or collateral branches, at any future period; and of connecting the same with different rivers, canals, or rail-ways, making the parties a compensation in tolls or otherwise, if such connection shall appear to draw off or lessen the trade upon any part of their line of communication, as often happens; and such ought always to be carefully investigated, and liberally embalmed by the engineer, and the company be advised to act accordingly.

In surveying a line of country for a rail-way, principles somewhat different from those which apply to a canal, are to be kept in view; in the latter case, exact or dead levels are traced out, and the cafe of towing or dragging boats thereon is nearly the same in going one way as in returning the other, whether laden or not; for the ascent or descent of the locks or planes are there overcome by a different power than that applied to towing upon the levels; in a rail-way the case is different, the horse which in going one way draws a heavy load down a slight descent, has to return again with the empty waggons, or a lighter load, up the same ascent. It will therefore be necessary, as a preliminary step to setting out a rail-way, to calculate as accurately as possible the quantity of lading which will at the first or any future period be to pass each way upon the line, or on any particular parts of it, because on this will depend, in a great measure, the slope that it ought to have, and consequently the ground which the rail-way line ought to occupy. If it should appear, on an accurate calculation, that the same weight of lading may be expected to pass one way as the other, or that the same will preponderate at some periods one way, and at others the other way, the rail-way must in this case be lifted in levels or very nearly so, and the unavoidable ascents and descents must be made by inclined planes, as before mentioned; on which either a greater number of horses must be stationed to draw waggons up, and in letting down, their wheels must some of them be flapped; or loaded descending waggons must draw up the others; the descent of a weight or tub full of water in a shaft must draw up a waggons, or more than one; or, a steam-engine, horse-gin, or walking-wheel, must be used as a moving power, with fly or brake regulators of the motion, as we have before mentioned. If the trade will always preponderate one way, as it generally will in the descent from mines to navigations, and the ground will admit of the same, the regular inclination of the rail-way ought to be such, that a horse can draw the usual lading down with the same cafe as it can return with the waggons when emptied, or with a partial lading, in case of there being a small ascending trade. If the slope of the ground shall be found greater than to suit the above calculation, the rail-way ought to be set out for as great lengths together as is practicable, with the proper slope, and then to set out an inclined plane, as before mentioned. It ought to be well considered, where a rail-way or a branch from the same appears likely to have a descending trade at present, whether, at a future period, by extending the same forwards to any town or manufactury, or by other change of circumstances, the ascending trade is likely to be materially increased, in proportion to the descending; because in such cafe, the line would require to be altered in its slope, and moved to a new place, or it must continue to be worked to a considerable disadvantage by the horses having to travel down the line unemployed, to fetch up a portion of the loaded waggons. It will readily be perceived, that the adoption of the best line, of which the circumstances of the trade and nature of the ground is susceptible, is a task requiring a degree of skill and patient research, not at all inferior to any thing required in the setting out of a canal, and it can hardly be necessary to point out the necessity of employing the most competent engineer, and allowing him proper time and assistance, in order to get the most eligible line marked out. A rough sketch of the different routes which appear eligible for a rail-way made by levelling with a spirit level, will be very useful in the first instance; from which, and, a view of the ground, the engineer will be able to determine nearly the place and extent of the inclined planes, or steeper parts of the rail-way which will be necessary; these last being always made as short as the nature of the ground and circumstances will admit. These being settled, the line of the intended rail-way must be traced on the ground, beginning at the highest point, and stretching a chain on the ground, one end being held at the point of departure, the other must be turned round upon the face of the descent, until a point marked by this end is found, which is one link or something nearer or less, according as the slope is to be) lower than the upper end; the chain being now moved forwards, till the hinder end rests on the point last determined, the other end is to be moved, accompanied by the levelling target, until a new point is found, one link lower than the last, and so on; by which, a line having the regular descent of one link in a chain, will be traced out on the ground, until the place of an intended inclined plane is reached. The flake which are put in to mark the place of each successive flake will, as in the case formerly mentioned, of setting out a level for a canal, be found very crooked in many places; and it will be necessary for the engineer to take out a new line, after a most careful view and consideration of the ground, as the approximate line for the centre of the rail-way; which must be without any sudden bends, that would occasion friction of the wheels against the sides or ribs of the rails. Single rail-ways will generally require about four yards wide, and double ones about six yards wide (exclusive of the necessary space for drains and fences), and this width will require to be levelled like a road or plane: it will therefore be proper to set out the line, that the quantity of flake which is to be lowered in one place shall always, with the least distance of throwing or bringing, make up other places which are too low. Where sudden valleys are to be crossed, it will be necessary to conduct the line, so as to cut into the hill at each side of it, to find the flake as readily as possible for forming the embankment: it will also be necessary to search carefully for gravel or stones fit for making the road between and under the rails; and if such can be got in the line, it may be a considerable saving of labour and of damage to the land, as well as a source of future advantage to the concern, to cut pretty deep into such materials, as we have before suggested and explained on the setting out of a canal; which the reader, who wishes to understand this subject, would do well to consult. A line of flake, exactly at a chain (100 links) apart, should be put into the line last flaked out, and drove successively into the ground, beginning with the highest, so that the head of each may be very exactly one link (that being the fall we have assumed) below the level of the last; of course these will either stand above the ground, or be drove in the bottom of a hole, according as the ground wants raising or sinking, and will enable the engineer, on a review of the line, to judge more correctly, or to calculate where necessary, whether the line is set out in the right place to be formed at the least expense of labour, and with the least damage to the land; and when this is
found to be the case, the necessary width of land can be determined on, and the same surveyed and described by the surveyor, for the purposes of depositing the necessary plans with the clerk of the peace and with parliament. The different regular flanks or parts of the road being determined in this manner, the deeper flanks or planes that may be necessary to join them, must next be cut out and determined, by taking the whole or difference of the levels of the two ends, and dividing the same by the number of chains that the plane is to be long, for obtaining the fall which is to be allowed between each pair of flanks, instead of a link as before affirmed. In letting out a single railway, it will be necessary, at proper intervals, to allow the width of land proper for a double railway, for a short space, in order to form passing-places for the waggons that are coming different ways. As part of the railway will in most cases be conducted along the side of a hill, or on side-lying ground, it will be necessary to consider the same in calculating to dispose of the flanks, and for the necessary ditches and drains for intercepting the springs and surface water in every instance, so that the ground of the railway may at all times remain dry. The draining, fencing, and bridges, will require to be done on the principles which we shall further on explain respecting canals; and the embankments, culverts, or tunnels, which may be necessary for preferring the proper slope in all places, are also to be done on similar principles to those of canals before treated of. It may be proper here to mention, that Mr. Robert Fulton, in his Treatise before quoted, pages 82, &c. has suggested and described different kinds of cast iron bridges for passing railways over valleys, either level across, one down a slope, and up the other of the valley, or rising obliquely up; in the first and last of which he proposc memorable to avoid any solid platform or top for carrying the horse path, and to tow or drag the waggons over this open railway, by an endless rope or chain, passing over a pulley at each end, which can be let in motion by a windlass, a descending weight, or other power. On the approach to a river or yard, where considerable quantities of coals or other minerals are to be discharged, it will be proper to keep the railway upon a high level, by embankment, or on arches, or on a stage of timber, that the waggons may be discharged from the top of a flails or stage into ships or boats, or into carts and waggons, without being moved by manual labour. Rivers, brooks, or hollow roads, must be crossed on bridges whose tops are formed to the regular slope of the plane; and where roads cross the intended railway, they must either be raised so as to be carried over, or sunk so as to pass under the same; or be made up to the same height; and the rails must, in that part, have ribs of less height and greater strength, and the whole must be so firmly embedded in masonry, that the heaviest carriages, in crossing, cannot damage it: an instance of which may be seen in Wandsworth town street, and at several other places on the Surrey iron rail way.

A considerable facility is occasioned in the constructing of Railways, after the plan of the whole is settled, the act passed, the land purchased, the work set out, and the ground levelled and properly settled, by being able to begin in any part where flone, gravel, and other materials that are wanted are to be most conveniently had, and to work from these places without the heavy expense of common carriage, except for the iron rails or blocks of flone for sleepers, if such are not found upon the line.

We will therefore suppose the work to begin at some point where the line intersects a rubble rock or a bed of good gravel, and the surface of the road is to be covered therewith for about a foot thick, and the same is to be nicely levelled, and any great or rough and out fixed stones should be carefully picked or raked off, that the whole may the sooner settle down and become one compact mass; these large stones may be thrown forward upon the uniformed part of the road, to be covered with smaller and better gravel. This covering of rubble or gravel must be nicely sacked and levelled and bed or rammed down, to make it as compact and solid as possible. A great quantity of blocks of hard and durable flone must be got in readiness, from 6 to 12 inches thick, and weighing 150 to 200 lb. each; the flanks of them is not very material, so that the bottom is liable to be firmly placed: under the stone, the top is to be chiselled to a level to receive the ends of the iron rails; in the centre of this flat part a hole must be drilled about 1 1/2 inch diameter, and 6 inches deep. Two flat and straight gauges of iron must be provided with pins riveted into their ends to suit the holes in the stones; the pins on these gauges should be at the exact distance on one of them to suit the length of the iron, generally three feet, and the other to suit the distance of the rails apart or breadth of the road, usually about 4 feet. One of the flones being laid in the proper place for the beginning of one side of the railway, and nicely bedded and rammed down upon the gravel, another flone is to be laid at 4 feet distance for the other side of the road, and for bringing them to the exact distance and level, the pins of the breadth-gauge are to be entered into the holes in each flone, and a common or mason's level is to be applied to the top of the gauge; if the flone laid is found too high or two low, it must be lifted up again, and gravel must be raked out, or more fine and good gravel sprinkled in and rammed down, until the right height is obtained; the flone is then to be laid on again, and brought to its proper place by means of the gauge and level; care is to be taken that the top of the flone is level, so that the flat ends of the gauge bed exactly and evenly on the flone all around the hole; and if this is not the case the chisel must be used to take down any irregularity and produce this bedeling of the gauge bar. A third flone is then to be laid on one side and the length-gauge pins entered into the holes, by which the exact and proper distance of the flones will be ascertained, and for trying the truth of this flone as to height, a level is to be used, in which a line is very carefully drawn by the engineer, making the exact angle with the perpendicular line that the railway is to make with the horizon; this being applied upon the length-gauge will show whether the flone laid requires more gravel under it, or any to be taken out, observing always to level the gravel carefully and to ram it down, and also to ram the flone down upon the gravel, before each ultimate trial of its proper position as to level, its distance measured by the gauge from the other flone, and its range by a line stretched in direction of the intended railway. With these precautions the flones are to be successively laid, and gravel of the best quality, and without any large flones, is to be laid in, to fill up the spaces between them; and none on the outside of the flones, the better to secure them in their places; and when a certain length is done, as no mortar or other soft material is used which requires time to dry or set, the work is ready to receive the rails, and will be then immediately fit for use, to carry forward the gravel, flones, and other materials for the work as it proceeds. We have before mentioned that the ground work should be settled; and for this purpose the levelling of the road should be performed early in the winter, and the rains and frost will effectually settle it, by the time the work gets dry enough in the ensuing spring; before
before which, the work should be carefully gone over again, to level and fill up any parts which have settled more than was expected and allowed for.

The *café Iron Rails*, in the earlier use of them, as on the extension of the Caledon branch of the *Trent and Mersey* Canal, to Mr. Gilbert's lime-works, 4 miles in length, (which was in use long before 1794,) were fastened down upon longitudinal rails of wood, which lay across several wooden sleepers, embedded in the gravel, as we have described above; these rails were three feet long, and had two holes, at 18 inches apart, to receive the wooden pins which fastened them down, or rather confined them in their places, on the wooden rails: (see fig. 31, *Canals, Make it.*) At one end there was a triangular projection, and at the other a similar notch which fitted into each other; a rib stood up along one side, to confine the waggons wheels to the track; and opposite the holes, the rail which was about 1½ inch thick and weighed about 42 lb. was made wider to strengthen that part; yet, with this precaution, such rails were very liable to break in two at the pin holes, as well as to loose their connecting triangular piece; the rib also was very liable, by the wheels or other things striking against it, to get broken off near the ends, and the waggons were not confined from running off the road in such places. The rails of the *Surry Rail-way* are represented in figs. 32 and 33, and are, we believe, of the most improved contraction; they have their ends reuting on separate blocks of stone embedded in the gravel as above described, and, instead of pin-holes through them, each rail has a similar rectangular notch in its end, which, when two of them are laid close together, forms a counter-work-hole for a square and headless spike of iron, that is to fasten the ends of both the rails. These rails consist of a rectangular plate of cast iron, 3 feet 2 inches long, 5 inches broad, and 1 thick; a piece of metal about half an inch thick is added in the casting, to increase the thickness at each end for 5 or 6 inches in length, in which to fit on the stone and receive the spike; a rib is cast on to each edge of the rail, one of them above, and serves to guide and confine the waggons wheels; the other below for adding strength; these ribs which are about three-fourths of an inch thick form by their top the segment of a large circle, being about ½ inches high in the middle, and about ½ inch at the ends, by which these ribs are calculated to give the greatest strength to the rail in the middle, where it has no bearing, and to make them not to be easily snapped or broken off, as mentioned of those rails above, whose ribs are of an equal height throughout; small circular projections of metal are cast on to the width of the rail near each end, and the fame are carefully bedded upon the stone, for preventing the rail from being overturned laterally, by the action of the wheels against the rib. For crossing of common roads, the rib, (see fig. 34,) is made only an inch high throughout, and near an inch thick, and its edges are well rounded off. In these situations, a few rows of pavement, of good square stones, such as the carriage way of the streets of London are now paved with, are kept nearly or quite as high as the ribs of the rails, by which the heaviest waggons, carts, and coaches pass over them almost without any possible jolt. Crossing-rails are used at every passing-place, or point where waggons are to pass out of one track of rails into another, which are very numerous in the company's yard, and by the side of their basin or dock for barges, in order that empty waggons or those loaded may be readily pushed into one of the tracks further off the wharf, to let other full or empty ones advance, on their proper track, to the sides of the barges. A B C D, fig. 35, represents one kind of crossing-rails, them in connection with four common rails, parts of which are represented by E, F, G, and H; a wedge or tongue of wrought iron, I, is movable round a pin, and is represented in the figure, as placed against the flub K, so that the track from G to F is clear for one of the wheels of a waggons; and by moving the wedge I till it rests against the flub L, the track from H to E would be clear; before the waggons can pass in the directions above-mentioned, the wedge will often want moving by hand to the proper position, but in going in the opposite direction from E to H, or from F to G, the action of the wheel against the wedge will always move it into the right position; there is a circular guard or flub cast on to the rail behind the joint of the wedge for preventing the wheels from striking directly against the end of the wedge.

The method in which the rails are fastened to the blocks of stone on which they rest, is by an octagonal peg or tramun of good found dry oak, fitted to the hole in the stone, so as to drive easily into the same, otherwise its felting by wet and the driving of the spike might split the stone, this plug of wood is not long enough to reach the bottom of the hole, and is sawed off even with the top of the hole; a hole is then bored through this plug of wood, and an iron spike with a flat point, and a head just fitted to the counter-bank notch in the ends of two rails, when applied endways together, is drove; by which the rails are sufficiently confined, and yet in case of any wear or settling of the stone, so that the rail gets a little loose, it is capable of moving that small space without breaking out the sides of the pin-hole in the rails. It will be proper, always to drill a small hole from the bottom of the plug-hole, quite through the stone, for the rain water to sink away into the gravel, otherwise the freezing of water in the holes would often burst the stones. Care must be taken from time to time, to keep the tread or surface of the rails clear of dirt or stones, which last would slip the waggons, and perhaps break the rails; and too much pains can hardly be taken by raking and fortifying the gravel, for the finis or top of the road, and rolling or ramming of it down, to settle the same into a compact and hard road as soon as possible, having no loose stones, which the horses are always kicking on to the rails, and while this is the case, the man who attends the waggons should always go before his horses, and look carefully to the rails, and remove any stones that may have got upon them. The waggons in most general use on the *Surry Iron Rail-way* weigh, including their loadings, about 3½ tons, the wheels are two feet five inches high, of cast iron, with 12 spokes, which get wider as they approach the hub, which is eight inches long to receive a small wrought iron axle; the fellies or rims of the wheels are two inches broad, and nearly as much thick, and the sharp angles are rounded off, so that these wheels are capable of being used without damage on any hard common road; a very principal advantage attending the modern use of rail-ways. The axes of the wheels are fixed at two feet seven inches distance; the bodies of these waggons are seven feet nine inches long, four feet five inches wide, and two feet four inches high; these are used for bringing down chalk from the *Surry Hills* to make lime, carrying back manures, &c. The founders, and others upon the line, have trucks or waggons of different kinds to suit the nature of their goods; the only apparent limitations being in the width of the wheels and carriages, the length of their axles, and weight of laden goods.

For the more ready emptying or flushing the contents of the waggons into barges lying in the dock, a strong flage is erected on the wall, which projects over the water, and in order
order to turn waggons short round and back them on to
this stage, the rail-way passes over a large circular plate of
cast iron, which is suspended on a pin beneath its centre;
there being a circular ring under its circumference, which
moves round freely, with a considerable number of small
wheels or rollers, whose axles are fixed therein, (see figs. 45
and 47, Plate VII.) upon another circular iron plate firmly
fixed below; by this arrangement, it happens, that as soon as
the fore and hind wheels of the waggons are advanced on to
this circular plate, a very small force applied to the waggons
will turn it a quarter round, along with the plate and rails on
which it rests; the waggons are then run backwards off the plate, on
the flange before mentioned, and its contents are shot into the barge
below; it is then returned upon the plate, and the same is
turned round until the rails thereon match the track, and
the waggons can then move forwards, to make way for anoth-
er loaded waggons, to be emptied in like manner, or it can
be shoved backwards to a croosing-place, as may be required.
A ton weight or more in a waggons can easily be shoved along
by a man, as he does a wheel-barrow. Rail-way branches
are capable of being conducted into every foundery, or other
great work near the line, to terminate under their large
cranes for hoisting goods, so that heavy articles can be loaded
at once on to trucks for the rail-way. The branches of a
rail-way admit of being multiplied almost without limit;
farmers and others who have but an occasional trade, may
have their own waggons to be kept locked, and left for them
by the side of the rail-way, one or more at a time, from the
gang that is palling along the line. About November 1800,
294, the adoption of a double rail-way for heavy carriages
between London and Bath; and about March 1802, Mr.
vol. i. p. 221, the experiment to be tried, on one of the great
roads, for ten miles or more out of London, of a rail-way
with four tracks, one for flow and another for fast travelling
carriages going each way, in order to avoid meeting or de-
lay; these he propos'd to adapt to chaises and stage coaches,
by means of low cradles or platforms, with wheels adapted
to the rails, on to which a coach, coach, or other carriage,
could be drawn, and there confined, in order to be drawn
along the rail-way; and which cradles the coaches might
leave at any defined point, to be drawn on the common road,
which he propos'd to have by the side of his rail-ways. Dr.
Anderfen, in the volume above quoted, recommends rail-
ways to be made from the docks in the Isle of Dogs, to dif-
fent points in the environs of London; and he propозes
the bodies of these rail-way waggons to be moveable, and to
be hoisted off by cranes with their lading in them, and be
placed on other, and larger wheels, with shafts adapted to
the fleets; which, after delivering their lading, would re-
turn, perhaps laden with other goods, to the cranes to be
replaced on the rail-way wheels. In vol. v. p. 291, of the
doctor's work, Mr. is recommended to use waggons on the
proposed rail-way with wheels large enough, and of a pro-
per construction, to be used in the fleet also. Wherever any
considerable work is to be done, as in the excavation of the
London-Docks, it has been found to answer, to lay down
temporary rail-ways; and such as admit of being moved as
parts of the works become complete. For the use of mines,
this facility of removal is often of conuenience, as the veins
or pits wear out.

Doctor Anderfen observes, that 20 tons, in a barge upon
a canal, will be drawn with ease by one horse, travelling at
the usual rate that waggons move; and that on a rail-way
the same horse would, under favourable circumstances, trans-
port the same quantity of goods in a given time; but Mr.
Fulton says, that five tons to a horse is the average work on
rail-ways, defecding at the rate of three miles per hour;
or one ton, upwards, with the same speed. Mr. Telford
observes, that on a rail-way well constructed, and laid with
a declivity of 55 feet in a mile, one horse will readily take
down waggons containing 12 to 15 tons, and bring back
the same waggons with four tons in them. Mr. Joseph
Wilkie in 1798 related, that a horse of the value of 20l. drew
down the declivity of an iron road 1/2 of an inch at a yard,
21 carrigines or waggons, laden with coals and timber, weigh-
ing 36 tons, overcoming the win inertile repeatedly with ease.
The same horse, up this declivity, drew five tons with ease.
On another part of the road, where the acclivity was 1/2 of
an inch at a yard, the same horse drew down three tons;
but it was necessary to slipper or lock the wheels here, to
prevent his being overpowered by the defecding weight.
On a different rail-way, one horse, value 30l. drew 21 wagg-
ons of 5 cwt. each, with their loading of coals, amounted to
47 tons 5 cwt. down the declivity of 1/2 of an
inch in a yard; and up the same place, he afterwards drew
seven tons; the cwt. in all these experiments of Mr. W.'s
being 120b. In the summer of 1805 a trial was made on the
Barry rail-way by Mr. Baskes, wherein a horse, taken
indefinitely out of a team, drew 16 waggons, weighing
upwards of 55 tons, for more than six miles along a level
or very slightly declining part of the rail-way.

Dr. Anderfen has calculated the expense of carrying goods
in common waggons, or turnpike roads, a distance of eight
miles, at 84d. per ton, and of carriage, the same distance,
on a rail-way, at 4d. per ton, or only one tenth part of the
former. Recreations iv. 208.

For steep descents, fedges, or flippers of iron, must be
provided, similar to those in common ufe with road-waggons,
which can be placed under the wheels of the rail-way wag-
gons, and hooked to the side of the waggons by a short chain,
in order to caufe the wheel or wheels to ride upon the rails,
whereby the tendency to defecd may be checked.

Mr. William Chapman has, in his Observations, p. 42
and 54, recommended the ufe of waggons, that are to run on
to the rail-ways that are to be prepared in the bottom of a
flat-bottomed boat, instead of unloading the contents of the
waggons into the boat; and when this boat with its waggons
has arrived at its destination, the waggons are to be run out
upon other rail-ways, to proceed forwards by land if necessary.

Mr. Carr, we are told, has introduced in the mines of
Shropshire, and other places, a flight kind of iron rail-ways,
called train-roads, for the ufe of very small waggons in their
under-ground works.

Mr. R. L. Edgeworth has suggested (Nicholson's Journ.
8vo. i. 223.) the ufe of light circular chains running
upon rollers, which are to be put in motion by small Steam
engines placed at considerable distances; to these chains he
proposes carriages to be attached, for droging them along
upon rail-ways instead of iding horses. Since Steam-engines
have been brought into ufe, to work by the expansive force of
Steam, and requiring no water for condensation, a success-
fual trial of applying them to moving the trains on a tram-
road has been made, viz. in February 1804, on the Cardiff
and Merthyr rail-way, where 10 tons of iron (long weight)
loaded on tram-waggons, with the additional weight of
about 70 perons for great part of the way, we're drawn for
nine miles upon the tram-road, at the rate of near five miles
per hour, by the ufe of one of these Steam-engines fixed on
its own waggons made by Mr. Homfray, (for which engines
Mr. Trewthick had previously taken out a patent, though it
C A N A L.

is perhaps an old invention) no supply of water for the boiler being found necessary in this distance.

The coil of a single rail-way, with crossing-places, for a defying trade, was estimated by Mr. Fulton, who wrote in 1795, at about 1000l. per mile. Mr. Wilks, in 1799, flatted, that the expense of completing a mile of single rail-way, where materials of all descriptions be convenient, and where the land lies tolerably favourable for the defect, would be about 300l. or 1000l. fenced, &c. exclusive of bridges, culverts, or any extra expense in deep cutting or high embankments.

Dr. Anderson mentions, in 1800, the sum of 1000l. per mile as the probable coil of a double rail-way in the most favourable situations, and of very flint ones in the vicinity of London, where labour is dear, not less than 300l. per mile; and Mr. Wilks says, that wherever the quantity of goods to be conveyed on a rail-way, having a descent of not more than 1\(^{1/2}\) an inch in a yard, amounts to two-thirds of downward, and one-third of upwards loading; it is a doubt, if it will not, in that case, be a cheaper conveyance than by a canal, besides the rail-way being more certain, where dispatch is necessary, on account of frost and dry seasons.

Another advantage attending rail-ways is, the greater certainty of the estimates for the same, when made with care and judgment, and the facility with which the whole work may, in general, be contrived for, to be completed at a flatted time. The principal rail-ways which have been executed, are the Cardiff and Merthyr, the Cannenboile, the Sirhowy, the Surrey, and the Swanysey and Ogysthurn; and such branches will be found to the Abbey de la Zouch, Cowford, Derby, Ercweath, Lancaster, Leeds and Liverpool, Peak Forest, Shropshire, Somerset Coal, Trent and Mersey, and several others, to which number almost every day is adding.

The constructing of Bridges for crossing canals and navigable rivers, often occasion a very tedious part of their whole expense, and this circumstance occasioned the attempt in some of the earlier canals, to subdivide paves \\

ford in many instances; Mr. James Brindley proposed these at first, for some places on the Trent and Mersey canal, and on the canal which Mr. Davis Dutch construction to the Tyrone colliers in Ireland there, were subituated in place of bridges.

Mr. Fulton has recommended the general adoption of fords on his small canals, but Mr. Chapman observes, that the water in such canals must not exceed two feet nine inches in depth, as otherwise hay, sheaves of corn, &c. in common carts would be liable to get wet in crossing. On the China canals we read, that there are elliptical arches of stone over their canals, the longer axis being vertical, and high enough for the masts of their vessels; these bridges being only intended for foot passengers, and are ascended and descended by leps. On our canals, bridges for foot passengers only are generally constructed of wood, and are mounted by leps, as at Paddington on the Grand Junction. In all large and important bridges the arches should undoubtedly be so formed that the materials thereof are in equilibrium, independent of the cement that may be used between the flones or bricks; the principles of which arches will be found in our articles Arch and Bridge: but for the common bridges for crossing of canals, which are wanted in such great numbers, flat semi-elliptical arches have been, in general, adopted, on account of such giving width for the canal and towing-path underneath, without raising the top any unnecessary height, which fo enhances the expense of landing up, or forming the slopes to the bridge. From the habits which necessity has in a great measure introduced with canal bridge-makers, of using only the best materials, performing the work with great care, and not fliking their centres too soon, such bridges are found to stand tolerably well, although very far removed from an equilibration figure; yet infusions are not wanting on most canals of their setting, and even falling down in some cases. A kind of brick bridges have long since come into almost general use on canals, of which we have given a plan, section, and perspective view. See Canals, Plate IV. figs. 40, 41, and 42. The form of these bridges is well calculated for saving of materials, and giving strength at the same time, the whole of the walls being more or less battering, and the side walls are playing outwards at their ends, to make the entrance on to the bridge the more easy, by which the side walls are rendered curving inwards in every part. In the building of bridges the utmost care must be taken to sink the foundations down to found fluff, or to drive piles on which to begin the work; it is a good practice to have wedge like or arching bricks made, on purpose to use after a certain number of courses of key bricks, or those forming the slits of the arch, and to introduce oblique courses of bricks for the more effectual tying of the work together, as we have mentioned in speaking of tunnels. Large bricks made of the bold earth and well burnt, should also be used, placed on edge upon the top of the walls of the bridges, as a coping, unless very good stone is near at hand, the top corners of the coping bricks or flones should be carefully rounded off in the making, in order that the same may present as few angles as possible for the weather or the traffic to catch hold of.

We have before mentioned the care which ought to be taken in every instance, to find fluff with the least possible expense of moving it, for landing up the bridges from these having, in some instances, been left too steep for the convenient and safe use of the public; it has not been uncommon, in later acts, to make provisions on these subjects; on the Grand Western it is enacted, that the acents to the bridges shall not exceed 2\(\frac{1}{4}\) inches in a yard, and on the Wilts and Berks this rate is limited to 3 inches in the yard at the most. The width of the carriage-way, on the bridge, in the narrowest places, is also fixed in some acts, whereas we have seen 12 feet mentioned as a limit in some cases. We have before observed, that the canal ought, if practicable, to be conducted into deepsea cutting, wherever a brick or stone bridge is to be erected, in order that the fluff may be thereby procured, for landing up each side of the bridge, and that the abutments of the bridge may be the more solid, and the foundations more likely to reach found fluff, without an extra depth of walling, or the necessity of piling for such purpose. On this account it is, that the tail of a lock generally presents a proper place for a bridge, and where the walling, which must have been made for wings, below the lower lock-gates, is avoided, or turned to account in the bridge. In places, where from the great traffic that is to be expected, or other cause, a towing-path will be wanted on both sides of the canal, the bridges should be made on a scale large enough to admit of a towing-path on both sides under the bridge, as in the two or three bridges nearest to Paddington balloon, on the Grand Junction.

For occupation, or accommodation bridges, and even on some public roads, as on the Skney canal, and others, a kind of lying or swing bridge has in general been adopted, of which some mention has been made under our article Bridge. See fig. 42 Canals, Plate VII. A flat platform of wood strongly framed together, covered with planks, and having side rails, is prepared, wide enough for the purposes of a bridge, and about half as long again as the canal is wide, in the contracted walled part intended for the swing bridge. One end of the platform for this bridge is framed as light as can be consistent with strength, and the other very heavy, with provision for flowing large flores.
stones or pigs of cast iron therein, so that the same will rest in equilibrium on a point at about one-fifth of its length from the heavy end; under this point, a large circular plate or ring of cast iron is fixed, having a smooth circular hollow sunk therein. An exactly similar plate is embedded, and firmly fixed on the solid wall at the side of the canal, except that this half has a strong iron centre or point flaring up, to enter a hole sunk in the upper plate to receive it. On this pin the bridge is suspended in equilibrium, and in order that no impediment may arise to turning the bridge round, when its balance is by any circumstance destroyed, a number of smooth cast iron balls, of two and a half or three inches diameter, are placed in the circular groove or hollow ring in the two plates, which act effectively as rollers for lessening the friction between the circular plates, in turning the bridge on and off the canal; or, a ring containing several rollers (figs. 45 and 47), is substituted instead of the iron balls above-mentioned, between the lower and upper plates (figs. 44 and 46). A recess is formed on the bank just to receive the bridge, when a boat is to pass, and when the bridge is turned across the canal, each end of the bridge (which ends are rounded into circular arcs, struck from the centre pin), slides on to a similar circular recess in the road, with a firm bearing at a very small distance below the ends of the bridge, when it is in equilibrium, on the centre pin and balls or rollers; by this arrangement it happens, that the heaviest loaded carriage crossing the bridge, is not able to depress either end of the bridge on which it passes, in any sensible degree. The engineer should carefully avoid the use of these swinging, or indeed of any moveable bridge, where the towing-path is to change from one side of the canal to the other, because the bridge must remain across the canal until a barge in passing, is got near enough for the towing-horse to cross over the bridge, and the bridge must then be turned off the canal before the boat can pass, and it continually happens, unless the towing-line is of great length, or is cast off at some distance before the boat arrives at the bridge, or the greatest dexterity is used, that the boat strikes the bridge before it can be turned off the canal into its recess; where several boats are closely following each other, these difficulties are much increased, and great delay must take place, or the bridge will soon be knocked to pieces. Swivel or turn bridges have sometimes been erected on the towing-path side, but they form there a most serious obstacle to the towing of boats; and on that account are generally placed on the off bank, and as no methods have hitherto been brought into general use, of turning them or shutting such bridges for persons to pass over them, except the persons, or some others, are at the time, on the same bank of the canal on which the bridge stands, in order to turn it over the canal; this has occasioned the necessity of clauses in every act, or set of bye-laws, requiring boatmen always to flush to every swing-bridge, or drawbridge, as soon as their boat has passed. The great loss of time and labour in thus continually turning the bridges on and off, the wear that such continual use occasions, and the frequent damage which such bridges sustain from boats striking against them, if, by the lesser delay of the boat-men or accident, they are not turned off before the boat gets up; have occasioned our thinking a good deal on the subject, in hopes of devising some method of turning the bridge on when wanted, from either side of the canal; because such a contrivance would authorize the alteration of the present regulations, and require each swing-bridge to be left open, and out of the way of the navigation, except during the time that it was actually in use, by persons or carriages passing over it: another material evil would thereby also be remedied, that is, the difficulty which now exists of preventing the farmers' cattle, in the fields on the off side of the canal, from passing over the bridges, and creeping along the towing-path, without an expensive circle of fencing and a gate to separate the bridges from the fields, for no gate or obstacle can conveniently be made on the towing-path side to obstruct their passage. Chains and pulleys under the canal, and motion conveyed upon Brunel's patent principle, in pipes under the same, were considered among others, as the means of turning the bridge on, when wanted; but, our speculations heretofore were, happily, at the moment of writing this (October 1835) interrupted by the information of a method, which was successfully brought into practice very lately, by Mr. Benjamin Bevan, the engineer upon the middle district of the Grand Junction canal, viz. near the steam-engine on the Wendover branch, where a swinging-bridge of the common construction, with a railing or fence on each side of it, has an addition made to it, on the side that is next the canal when the bridge is open, or in its recesses, at about three-fourths of its length, from the centre pin on which the whole turns; this consists of a job like that of a crane, or the bars that are sometimes used for flpping carriages at the ends of ftreets; an upright piece of wood is hung by two hooks and thimbles, like those of a common gate, to the standard or upright on the side of the bridge; to the top of this a rail of 4 or 5 feet long is fixed horizontally, supported by a brace underneath, from near the bottom of the upright piece; on the top of the horizontal piece are two strong staples fixed, adapted to receive the thickest end of a very slender and light pole, such as are used for the handles of hay-riakes, but they must be longer, and rather larger for wide canals; a nail driven in between the staples through the pole fixes the same, and makes it form a light and easily removable continuation of the top rail quite across the canal, so that a person, wanting to cross the bridge from the towing-path, can take hold of the end of the pole and pull by the same, and thereby turn the bridge over the canal; or, if a person has crossed the bridge towards the towing-path, he can with equal facility take hold of the end of the pole and shove the bridge round to the other side. The hinges of the jib that carry the pole are so adapted, that the pole has a tendency to hang directly across the canal, to the most convenient point for being taken hold of; but, at the same time it is with the least force turned round on its hinges until it is brought along-side of the bridge, and quite out of the way of boats that are passing. This very simple and cheap apparatus, we are told, answers effectually; no impediment is offered to the horse or towing-line; but when a boat arrives, whatever part thereof strikes against the pole, it recedes and suffers the boat to pass, and then by its own weight resumes its situation across the canal, ready for turning the bridge. The solid part of the jib is not made long enough to be liable to be struck by the boat, or a man flanding thereon; and poles in plenty, of the proper size and length, can be in readiness, for replacing in a minute any pole which is worn out or broken by accident.

Bridges which have no towing path under them, present a great obstacle to towing, because the line must in those cases be cast off from the barge; except, occupation bridges, like the wooden one at Rotterdam in Holland, could be introduced, where the bridge, we are told, consists of two separate segments, each supported firmly on its own bank, and leaving a flat quite across the bridge for the towing-mast to pass through, and thus they avoid casting off of the line: this flat need not be so wide but that foot passengers can with ease and safety step across it; and, on the passage of horses or carriages, a moveable flap turning quite flat back upon hinges, might be turned over to complete the road. Where
Where fixed bridges of great width and strength are required, and need but seldom to be turned off, as for admitting ships at high water to the HoA India and London Docks, double wooden or cast iron fixed bridges are in use, with a movable frame under each part, constituting parts of the ribs of the bridge, which frames turn on a hinge or joint, and are taken up or supported by a screw at the other end, to clear the walls of the bridge when the sense is to be turned off; and which, when the bridges are turned over to meet in the middle, can be let down by turning a winch, so as to fall in strong grooves prepared in the coping of the walls, and complete the abutments of the ribs of the bridge, as strongly almost as a fixed wooden or iron bridge could be made; an excellent example of which may be seen in Wapping dock, crossing the entrance to the London Docks, as mentioned under the article BRIDGES. It appears that Mr. H. Sneckrowell was rewarded for some improvements to swivel bridges which he suggested to the Society of Arts. See their Transactions, vol. viii page 327.

Draw bridges are not uncommon as accommodation bridges on some canals; the frame or platform of which, with their side rails attached, is moveable on strong hinges upon the top of the wall or one side of the canal, and, when down, slants into a groove prepared on the opposite wall, so as to prevent any projection or obstacle to the road over it. For raising these bridges, two strong and tall poles are fixed upright on the bank of the canal a little behind the hinges of the bridge; on the top of these poles are two very long and tapering pieces of timber called balance beams, which turn on a hinge near their middle, their small ends being connected by chains to the further end of the bridge, to which the thick ends of the balance beams are made to be a counterpoise, by means of lead or iron nailed on to the same if necessary; when the bridge is raised, or prepared for raising over, the balance beams, by their horizontal, there being a chain attached to the thick end of each, which hangs down and can be reached by a man or boy, and by pulling at which, he can rear the bridge up upon its hinges for boats or vessels to pass. For croffing the Docks in Liverpool in different places, very large draw bridges are in use, supposed to be the largest in England. But we are informed by Mr. Rennie, an engineer of the first eminence, that he has seen much larger draw bridges in France. On the Rhine and Clyde canal the draw-bridges are double, meeting in the middle of the canal when shut down. It appears that the Chimpole have a sort of draw, or rather rising bridges over the piers of the flood-gates of their canals, which, to prevent interruption to the mails of vessels, are constructed so as to be easily withdrawn when vessels are about to pass; they are flat wooden bridges, narrow and light, resting on rollers fixed in their frame, and running on a couple of hoist spars that are withdrawn after the bridge. Wooden bridges are very often wanted for carrying the tow path over the entrances to docks, or the side branches of a canal, and from their great span, to avoid a narrow place at the cutting; these are often attended with considerable expense; they should be constructed of very sound and durable timber, well truss’d, and as light as is consistent with strength, as they are seldom made wide enough to be used except by men and horses. We cannot too often advise that bridges of wood or iron, and those ones also of large span, should be wider at the abutments, and diminish by a proper curvature of the sides to the middle, to prevent the strain of the materials on a sudden lateral impulse, from causing them to give way and cripple sideways.

The ingenuity and enterprise of British artists have given rise within the last 30 years to an improvement of the management of navigation, by the introduction of iron bridges of great size and strength, by the adoption of which, in favourable situations, locks may be dispensed with, and thus the navigation may be made more commodious to the canal and lock makers. The iron bridges which are employed are generally composed of an iron arch or arches, placed within the arch, are prop’d by Mr. Ablomey on the Society of Arts, who calle the face, and presented to the Society of Arts, in whole collection, or may be seen by any one who enters in the Act of 1804: see their Transactions, vol. iv. page 327.

Bridge of iron over the Severn, within two miles of the town, we have already described in the article referred to, and have only to add, that Mr. Thomas Telford, the engineer of this bridge, has given a plate of the same in his "Agricultural Report on Shropshire," page 479. For the principles on which the Wearmouth bridge, which we have described, is formed, Mr. Resident Bridge at the 15th September 1793, took out a patent, which is in the Register, vol. vi. page 51, where a view of this very curious structure will also be found. We are sorry to add that we heard lately in conversation, that this bridge is shewn symptoms of pulling or giving way in late years, which have greatly alarmed some persons for its safety. The cast iron bridges at Bridge-water on the Forest river, and at Staines on the Thames, have been mentioned in our article referred to above; the latter, owing to the mistaken economy of the trustees, in having vaults made in the abutments, which ought to have been of solid masonry, gave way, and has been entirely taken down, as the new stone bridge erected before it, was obliged to be from the same cause. We cannot too much admire the prudent precautions of the select committee of the House of Commons in 1820, who investigated the different proposals for rebuilding London Bridge. (See Johnson’s Philological Mag, vol. x. page 137.) They confuted the opinions of the most eminent professional men, and had a very accurate test of models, confuted in brass by Mr. Byrne, the successor to the celebrated Roman. Under the direction of Mr. Atwood, for illustrating the nature and properties of equilibrium arches. One of the designs which were presented to this committee, and which has since been engraven by Mr. Wrefen Lowry and published, is that of Miers, Telford and Ropes, for a single arch of cast iron of 400 feet span, and rising 65 feet above high-water mark: as this scheme has not yet, nor ever may be carried into execution, it would be swelling the present article too much to detail the excellent provisions which the contrivers had made, for the execution and stability of this grand work. We proceed, therefore, to mention, that Mr. Fenton, in his treatise so often before quoted, has given designs (plates 14, 15, and 16), and explained the principles, page 120, of different bridges of cast iron. On the 24th May 1796, Mr. James Gordon took out a patent for constructing bridges which should be suspended from ribs of iron above; see Register vol. vi. page 220, and on the 6th February 1797, Mr. John Nisfe obtained a patent for a method of constructing bridges of hollow quoin’s of iron, that can be filled with masonry or other solid matter after the bridge is put together; the pieces of bridges he proposes in like manner to con...
bridge of hollow cases of iron, to be filled with masonry after they are brought to their proper places: see Report of surveys, vol. vi. page 361. Of wooden bridges for large and navigable rivers, we have given an example in the once jolly famous Schafthauen bridge over the Rhine, in our article Bridges. Mr. Fothergill mentions a very famous one at Wettingen in Switzerland; and has given us designs for bridges for newly settled and woody countries, wherein large timbers dovetailed together, supply the place of key-stones, above which the platform for the road is to be supported. The same gentleman has proposed in constructing the above kind, or iron bridges that are very flat and low, to obtain the necessary stability of the butments, by continuing the line of key-timbers or ribs with their proper curvature for some distance into the bank on each side. We have before spoken, under the article Bridges, of the proper form of the projecting angles of the piers of a bridge, and shown that for navigable rivers, sharp corners should be avoided, from the damage that such might do to the boats and vessels.

Bridges will be wanted in the construction of rail-ways for carrying the rail-road over rivers, sudden valleys or roads; some of these may require cast-iron arches; some of them must be of stone or brick; but oftener, such may with propriety be constructed of wood, taking care that they are effectively trussed, or formed on the best principles, also that the joints are effectively secured from wet, and the whole covered with a coating of mineral tar or paint, to be renewed from time to time, to keep out the weather. One other thing remains to be mentioned respecting bridges, i. e. owing to the contraction of the canal and curvature of the towing-path at a bridge, the towing lines are apt to fret and wear away the corners of the bridges, occasioning also a great waste in ropes: for remedying this, light hollow cylinders of wood should be placed upright, or nearly so, according as the wall is upright or battering, at all the corners of the bridges or other obstructions to the direct line of the towing-path; these cylinders being hung on centres or pivots, at top and bottom, they turn round by the action of the rope, and prevent friction and wear.

The Towing-path, horse-path, or haulway of a canal, should always be on the lower side if practicable, the traffic on the same having a tendency to consolidate the new made bank, to prevent the accumulation of weeds and the harbour of vermin, that by lodging in and perforating the bank might endanger the same. The towing-path should change as little as possible from one side of the canal to the other, and when this is unavoidable, it should be always done at some fixed bridge, to avoid the inconveniences before pointed out; the change ought never to be made in deep-cutting, as has been done near Tring on the Grand Junction. The towing-path ought never to be interrupted if the same can be avoided; and, besides having a way under all bridges (except those where a change of sides is to be made) we hope to see the example followed, which has been set at Atcham on the Shrewsbury, and Newbold on the Oxford canals, of continuing the towing-path through the tunnels, wherever the same shall appear practicable. On the proposed Bude and Launceston canal, it was intended to form a towing-path on both sides; a hint that may prove very useful in some situations of greater traffic, than there ever was likely to be on this canal. It is often provided in the act, that the towing-path may be used by the owners and occupiers of land on the line as a bridle-way, or as a drift-way for their cattle; as on the Afgy de la Zoch, Gratham, Leicesterfairs and Northamptonshire Union, Oakham, &c. Frequently, permission is given to persons to use the towing-path as a foot-path or bridle road, and we think it would in some instances be proper to obtain the power of laying a small toll on horse passengers; if the company should at any future time see it right by public necessity to prevent their towing-path to be abused. It seems unprovable to the object of a towing-path, to make public drift-ways of them in any case, on account of the damage which loose cattle would do to the banks and fences, and the impediments which doves of cattle would prevent to the hauling-horses and lines. In forming the towing-path, care must be taken to make the ground sound, and to cover it with a proper thickness of good gravel; and we cannot but recommend the making or frostig of this as it is laid on, throwing the large or irregular stones forward to be covered with better gravel, so that the surface may be smooth and even, without rough and large stones to throw the horses down, and render the use of the path unpleasant. On the duke of Bridgewater's canal, where proper materials for road-making are very scarce, the flate and flates, or refuse coals from the mines are brought out and calcined, or burnt in very large heaps, the cinders of which are used for making and repairing the towing-paths upon his canal. The height of the towing-path ought not to be less than one foot, or more than two or three feet above the surface of the water, or top-water line.

The fencing of the sides of a canal is a business deserving of more attention than has been usually paid to the same. Quick-fet or other live fences ought by all means to be made, except in the case of a rocky country, where good and durable walls can be built at an easy expense: rail or pale fences are very improper, except in and near towns, on account of their heavy expense in repairs. The continual wearing which quick-fences require, the great injury which the plants fallain from weeds, if the same are at any time suffered to grow up, and the damage which the pulling or towing of them is repeatedly done, is worn away the soil, and more or less exposing the roots of the quicks, and besides these, the plants being often wounded in their tender bark by the hoes used by the weederists, are most serious difficulties in the raising of quick-fences, wherever our experience has extended, except in the north-eastern parts of Norfolk, where the spirited and intelligent tenants, that there abound, have a method of raising fences, which they which are continually doing during the currency of their leases, that we are happy, in this instance, of being able to mention, because it has not yet, we believe, appeared in print. The line of an intended hedge and ditch being marked out, the first step is to collect carefully all the top-soil or vegetable mould into a ridge where the centre of the bank is to be, and if this vegetable mould proves too abundant, the extra quantity is thrown into heaps further off, in order to be mixed with dung, or carted to some parts of the land, which wants a greater supply of mould. This done, a row of spits or heaps of earth out of the ditch are laid carefully in the front of the bank, and on these, when reduced to a regular line by paring with the spade, the white-thorn fets are placed a little inclining upwards, at about four or six inches apart; care is taken in laying in the fets, that their roots are bedded in the vegetable mould, that is to form the centre of the bank; when this is done, another row of spits or heaps is dug out of the bottom of the ditch, and laid upon the quicks, which being patted down and leveled at top with the spade as before, another row of quicks is laid in, taking care that each plant in the upper row is over a space in the lower one, and that their roots are included in the top-soil. Other fods are then dug out of the ditch and piled up, with the proper slope or batter, until the bank is raised to the intended height; the vegetable mould is then drest up into a regular bank at the back, and the remainder of the fluid
fluff from the ditch is thrown over, and is afterwards carefully spread and laid up against the back of the bank, so as entirely to enclose the vegetable foil in a caafe of dead earth, or fluff taken from below, where cultivation has depopulated the foils, or mature the vegetation roots of such plants. Still further to accomplish this exclusion of the foil in the bank, from the action of the sun, air, and other flammable materials, vegetation, at a proper feaon in the spring, a quantity of dead earth is piled up from the bottom of the ditch, and worked and chopped about, until it is in the state of puddle, before deforbed. The top of the quacks are cut off neatly even with the ground, after which, a labourer carefully platters every part of the face of the bank with this prepared or puddle-like fluff; and after it is laid on, having a puddle-full of water at hand, to wet its spade if necessary, he works this platter about, giving the flat surface of his spade exactly the circular and plattering motions that platters use when at work on a ceiling or wall. If it should appear that frogs have molested down, or injured the face of the bank, the same is carefully repaired and worked again, as above, before the feaon for the vegetation of the quack. All such as the white-thorns have put forth their leaves in the spring, a careful labourer walks along the ditch, with a knife in his hand, and wherever a plant is springing, from among those which have footten, he digs in the point of his knife with care, to find and release the top of the set, which other-wise might be smothered and conformed by the plattering of the bank. The benefit of this procedure is inconceivably great, in almost totally preventing the growth of weeds, and in confining the moisture in the vegetable mould from escaping in dry foils. At a time in the summer, when every part of the surface was covered with vegetation, we have with pleasure examined some miles in length of quacks treated in this manner, and although the quacks had made the finest foils which could be imagined, not a vestige of vegetation of any kind beside was to be found on the bank; and thus, with proper care in renewing the plattering or working of the bank, many of them remain until the quick is grown up to be a fence; and it is almost literally true, that weeding is here unnecessary, although no foil can be more congenial to, or worse foiled with the foils of annual weeds, than some of those were of which we have been speaking. The ditches are made deep, and the sides of them as steep as the foil will stand in the general, so that dead or guard foences are generally omitted on that side; and so they are often on the other, or back side, and a prick-hedge is substituted, which, with care, and the letting of steep only foole in rich fields, answers the purpose very well. Some time before the bank is made up to the intended height, the labourer goes along upon the top of it, shovels off the loofe top, and treads down the top of the bank so as to form a flat of perhaps 12 or 14 inches wide; into the centre of which he pours water, and gets the foame a longing motion, so as to open a narrow and deep notch in this operation he repeats, until a notch of this form is opened the whole length of the bank; then he proceeds to lick this with short and rough bushes, so close as to make a complete hedge; he then throws up out of the ditch as much fluff against the bushes as will lay on the plane or top, in which the hedge is struck, and beats the face down strongly with his spade; the foame proceeds at the back of the hedge, by which these bushes are so securely set into the bank, that they will often stand until the quick is become a fence; in places where the destructive piltering of the poor is properly repressed. Some may perhaps consider us as going here too far into the subject of fencing, but we requent of such to consider how important the subject is to a canal-

company, which may have to raise much more than a hundred miles in length of quick-fences, as was the case a few years ago with the Grand Junction canal company, and some others, some of whom are still feeling the very heavy burden of fencing their quicks, two, three, or four times annually; which an adoption of the above principles would, we are certain, have tended to reduce most materially. See our articles INCLUDING, FENCING, &c.

The quick for a canal ought to be placed a little above the level of the towing-path, and be separated from it by a small ditch, to prevent the towing-horses from being in trampling on the quick; but the principal ditch, where the sudden falling away of the off-bank does not afertain the same purpose, ought invariably to be on the field side, for keeping the farmers' cattle at a proper distance from the quick, and to check their attempts at jumping through or over it. The quick ought not to lie placed too near the towing-path, and the hedges should be carefully cut and placed about every twelfth year, both to preserve them vigorous and in good growth, and also to preserve the towing-path clear. On the Oxford canal, near Brentford, we remember that the hedges were so close above the towing-path, in the year 1799, that it was quite dangerous riding along them, and the horses were driven so near the edge of the canal, by the intrusion of the hedges on the path, that the bank was suffering materially. In places where the canal is embanked, it will be proper to place the hedge at the bottom of the slope, in order to enable the company the better to prevent the growth of rank and large weeds, and the consequent harfoning of vermin, which would lodge in the bank; steep embankments might also be materially damaged by the treading of cattle on their sides. Through common fields, or very large pastures, it is sometimes not necessary to fence off the towing-path thencefrom, but at the boundaries or entry to such fields, a gate is placed in the towing-path, to prevent the intermixture or escape of the cattle; and generally these gates are double, falling rather forcibly towards each other, by which construction the cattle are prevented from pushing, or the wind from blowing open the gates, as would otherwise often happen.

At the terminable of every principal estate or farm that adjoins the towing-path, it is usual to place a flying wing across the fame, to prevent cattle getting away, in case they should break, or by accident get into the towing-path. Cylinders should be placed, as before described, against each of these gates for the towing-line to run upon; and fide rails should be placed inclining up to the top of the poles, to affil the rope in getting over the fame.

Draining is another expensive business, of which a canal company will have a good deal to perform, in most cases. Soon after a canal is filled with water, and often sooner on the upper side, owing to the course of the land springs, and that of a more permanent character being intercepted by the puddle ditches, wet places will appear on the land, which would, if neglected, become unfit for cultivation; these are often of considerable extent below the canal; and the committee of the canal company must not be surprized at hearing the farmers attribute many wet places in such situations, to the roofing of their canal, that really are not affected thereby. It would be of use, and the source of much satisfaction, if the resident engineer were to note down in his book all the wet and springy places that appeared on the sloping land, below the level of the canal for a considerable distance, and the condition or run of water from each before the canal was made; because the appearance of new quakes, as the farmers in many parts call them, or the increase or enlargement of others, is often the first and only indication of...
an increasing and hurtful leak from the canal. The committee should not be nice in drawing the line, as to the extent of draining which they order to be done; but it would, on the contrary, be highly to the credit of their concern, and the interest of future canal schemes, to bear the whole or a portion of the expense of effectively draining all the land, whose wetness could, even in mistaken prejudice, be ascribed to their canal. The execution of these operations ought not to be confined to the quackery of boring a hole here and there in a trench, without any theory or meaning; but the resident engineer, or some professional man employed expressly for the purpose, should, by a judicious application of his experience and knowledge of the firsts in every place, apply that particular method of draining, as to the situation and depth of the drains, &c. which every spot may require. And these operations are more various and important than what any person, who has not made the subject his particular study, can possibly be aware of. See our article Drains.

There is a danger attending drains made near a canal, from rats or moles working their way unobserved beneath the surface, between the drain and the canal; for detecting which, or other leaks, it will be proper for the resident engineer to enter in his book a minute description of the situation of the mouth or vent of every drain, choosing situations for the same, when they are made, in ditches, where they can be readily got at, and not be liable to be damaged by time, or the trampling of cattle. The length and direction of every branch of under-drain which vents at that month, should be noted down, and the quantity of water which the drain discharges should also be carefully estimated, at some short distance of time after the same is finished; and a regular and periodical inspection of these drain-mouths by the engineer with his book in his hand should be made, by which any secret leak could hardly fail of being detected. It is almost unnecessary to point out the importance of an attention to these circumstances, in situations where water is very scarce.

The construction of Boats for canals and rivers requires some notice in this place. Mr. Chapman, who has given some excellent directions respecting the form of boats liable to overfet or be injured by heeling, has very properly observed (Observations, p. 102.), that the area of a crois section, of a boat to be used on a canal, ought not to approach so near to the area of a crois section of the water in the canal as 1 to 3, or considerable inconvenience will arise, both from the increased resistance of the boat, and the damage to the banks, from the counter current to fill up the space the boat leaves in her rear. This circumstance requires particular attention, particularly in boats that are to move quick, like the passage-boats from Manchester and Paddington, on Bridgewater's and the Grand Junction canals; in the former of these, we observed a constant elevation of the water before the passage boat, as it moved along, of at least 2 inches, and perhaps more than a foot at times; and the rapidity with which the water ran backwards, between the boat and the sides of the canal, appeared to have a most destructive effect upon the latter, particularly on the towing-path side; and often this was laid quite under water, for considerable distances together, by the surge or wave opposite to the head of the boat as it passed along; while the labour of towing was most materially increased. We regret that we had not the means of ascertaining, how much the head of the boat was elevated upon this artificial wave in the general, and up which inclination the towing mules were contantly draying it. Some attention ought to be paid to the form of the head and forepart of the boat, with a view to its letting the water pass freely off by its side: flat headed boats, and those whose ends are rectangular in particular, ought not to be towed fast, or great loss of labour and damage to the banks will be the consequence, unless the canal is very wide and deep. It has been proposed to form boats sharp at one end and flat at the other, so that the flat ends being joined, two of them may form a body, diminishing properly at each end, for easy passage through the water, and for steering. Mr. Nicholson King, an American, has proposed boats in four parts, that can be detached when the fame are to pass an inclined plane, and he afterwards rejoined. Since the use of calk-iron has become so general, Mr. John Wilson has contructed boats and barges of iron, some of which are used on the Severn river, and others upon the different canals in Staffordshire, Worcestershire, &c. Mr. Robert Futing, in his Treatise, p. 31, has proposed and described a kind of rectangular boxes, with low wheels (or rather trucks, as the axle and them are to be call in one piece) fixed under their bottoms, to be used upon canals instead of boats, on account of the use which he proposes to make of them, upon inclined planes and railway-passages, as well as on the water, as we have before mentioned. Mr. William Chapman, who has examined this system particularly, in his Observations, has proposed and given drawings of wheeled-boats of a different construction, larger wheels let into the bottom of the boat being used; and his boats are so contrived, that several of them, linked together by their ends, can be used together either upon a canal, or a railway, or plane. The same author has recommended and described a kind of flat-bottomed boat, with a sngle or double rail-way on its floor, which he proposes to receive or discharge a loading of railway-waggons, as it lies in a shallow dock, from which the water has been drawn, and to which it is to be again admitted when the boat is to float out into the canal. For ease in getting loaded waggons in and out of these boats, a pair of leaver, or water-tight slaps, are contrived to let down, and permit the junction of the fixed railway on the land and the part thereof that is on the floor of the boat. A curious method of steering boats is in use on the Bedford, Ouse, the Cam, and others of our eastern rivers: two boats are always used together, one of them having a strong pole, or bow-sprit, projecting horizontally from above its prow; this is brought over the stern of the boat which is to go before it, and the prow or stem of one boat is fastened by a rope close to the stern-pole of the other; to the first boat the towing-line is fixed, and the bow-sprit of the latter boat is used as a tilter to set or retain the hilt boat to any required angle with the first, by which the hilt boat acts very effectually as a rudder for steering the first. Mr. Chapman proposes to adopt this principle with small boats upon canals. The wili-country bargemen, on the Thames, guide or flop their boats, as they are floating down the stream, alone, or with others, by harnessing a horse at the bottom, and a cross handle at top, round which they dexterously wrap a short rope, fastened to the side of the hilt; the pole has struck into the bottom of the river. For speedily emptying the cargoes of small boats into larger vessels, Mr. Davis Dukart contrived, on the navigation to the Dungannon Colliers, to float his small boats on to cradles or wheeled carriages, on which they were dragged up a short inclined plane, and upon a railway conducted over the barges in the basin; and then the boats could be turned over, and their contents shot at once into the barge. A different method, as Mr. Chapman informs us, is practised in South Wales: it consists in continuing the canal (which may be a wooden trough) to the place of discharge, and terminating it on a caisson, suspended on a traverse centre; the boat being arrived at its place, the end of the canal is closed.
The meaning of Boats upon canals or narrow rivers, where sailing is impracticable, has always appeared attended with considerable difficulties. Where the width and depth of water will admit, long oars have been used, worked by one or two men on each side of the vessel, as is done on the coal barges and lighter on the Thames in or near London. On the Tyne river at Newcastle, their keels are said to have been in use ever since 1578, and are rowed by an immene one on one side, another being used at the stern to steer by, and counteract the tendency of this strange mode of rowing. It is said that the large car is hung by an iron ring, so as to admit of its being laid on the gunwale of the keel, when not in use, but not of its being removed. Owing to the want of any regular and proper path on which horses could travel by the sides of the river, the first hauling or towing of boats was performed by men, as still continues to be the case on the canals of China; and in this country most of our navigable rivers were without horse towing-paths till of late years. Within our recollection, ten or fifteen men were seen tugging at the hauling line of a barge on the Thames, in the meadows of Twickenham. A good horse-path now begins at Putney bridge, on the south side, and continues uninterrupted on one side or other of the river to the extreme points of the navigation. These appendant appendages to navigation are not now completing on the Severn river, which has been so long famous for its navigation. The towing-path on many of our old navigations is continually interrupted and broken off, by mills and other obstacles, without any bridges for the crossing of the towing-horses and boys. On the Ouse river, below Bedford, we have observed the towing-path to be interrupted at the end of almost every field, by high and dangerous dikes, over which the ill-fated navigation-horses have to leep, encumbered by their harness and the heavy rope. No regular path is maintained, in a great part of the distance, by the owner of the navigation; but frequently the fine meadows there are cut up, by the track of the horses being at a considerable distance from the river, across the many bends that it has: and the farmer's grubs, between this path and the river, is rendered of little value, by the fouling and dragging of the hauling-rope over it; the banks of the river are also miserably worn away, by hauling so far from, and consequently so obliquely to, the direction of the stream. In many places, where the river is wide, there is no track for hauling, except along the bed of the river itself; where often the horses, with a wretched boy upon one of them, are seen sometimes wading, and at others swimming, along the course of the river! Nothing is more common than seeing the horses and boy have to swim over from one side of the river to the other, when the hauling-way changes; not unfrequently this is impracticable, from the total want of a way on either side, and the poor horses are obliged to leap from the bank, perhaps when at a considerable height and distance, into the head-room of the barge, to the great peril of their bones and neck: shortly after, these wretched animals, and probably with a boy on their back, are forced to jump out again, and perhaps plunge into the deep river and swim on shore, to resume their labour of towing. A correspondent of Dr. Anderson has expatiated (Recreations, p. 319.) on the hazardous light of six horses harnessed at length, towing a barge up the Thames above Putney, by a single line of insufficient length, by which the hind horses were in continual danger, in spite of their utmost exertions, of being precipitated into the river: what would this humane gentleman have said, if his walk had been along the banks of the Ouse, or a piercing winter's day? It is owing, in a great measure, to the enormous difficulties and expense of construction, and maintaining a proper horse-path by their side, that the navigation of many of our rivers is so imperfect. In all flat countries, except the river is embanked, as in Cambridgeshire, Lincolnshire, &c: and without any wide walk or fore-ground within the banks, the towing-path often cannot be made up above the reach of the floods, but, during every floods, will be under water and unfruitful: and when, perhaps, the water subsides, it will be found carried away by the force of the current for great lengths together. On some of our canals, the practice at first prevailed of towing by men; and the fame full continues on the Stroudwater canal, whose towing-path has flakes upon it, like those of a foot-path, at the divisions of different persons' lands. Horses are now, in general, used for towing boats on our canals, except the late duke of Bridgewater's, who reared a large and fine herd of mules, that were found to answer so well, that none others are used to this day, we believe, on that canal. Except with passage-boats, and flies or pocket-boats, for the expeditions conveyance of packages and parcels, the usual rate of tracking or towing upon our canals is about 3/4 miles per hour, including the time lost in pulling the locks, which, if of 8 feet wide, will require about 3/4 minutes each.

It is certain that there is hardly any limit to the load, which one horse can move, in a number of barges attached together, when going with a proportionally slow pace; and this has occasioned some canal advocates to assert that one horse will, on a canal, draw as much as 60 on the road; while Mr. Robert Mulehall has asserted, that horses will not be able to move more than 15 miles per day with deep laden barges on a level canal. On most of the wide canals it is usual to employ a horse to each barge, or two pair of boats of half the width each that the barges are. It appears, that on the Kelsey canal, on Bridgewater's canal between Worsley and Manchester, and others, several of the small boats in use thereon are linked together, and drawn by one horse or mule; there being projecting and smooth rails provided on the Kelsey, at all the convex points of the bank, to keep the boats in their proper track. Mr. Fulton has imagined, that 15 or 20 of his small rectangular boats, linked together, could be drawn by one horse, and be kept in their proper line upon the canal by a man with a boot-hook walking by the side of them on the towing-path. Besides the methods of towing and tracking, which we have been mentioning, on the Tyne, the Thames, and most of our rivers, hitches, fets, pсуs or poles, are used for shoving of barges along: the gunwale of the keels or barges is made wide and convenient to walk upon, and the boatman, being at the head of the barge, fets his hitcher against the bottom and shoves against it, walking along the gunwale of the barge until he has arrived at the stern; when he draws up his hitcher quickly, and returns to the head to repeat the same operation, and this sometimes on one side of the barge and sometimes on the other, unless there are two men employed, whose equal action could keep the barge in its direct course. This last method might be more useful than it is upon canals; but from the necessity which most of them have found, for prohibitory chutes in their act, against the use of any pointed poles, particularly such as are fixed or tipped with iron, on account of the damage which such often do, by penetrating and disturbing the lining and banks of the canal, the necessity of it has to be allowed. We have heard of an attempt lately, to introduce a kind of hitcher-iron on the Grand Junction Canal, which should present a flat end or surface, sufficient to prevent its penetrating the facing on the bottom or sides of the canal, and having a small turn up at the.
the point, which might remedy the loud complaints of the boatmen, at being dabbard a hooked pole on board their boat, by which a comrade, who has the misfortune to fall overboard or into a lock, might be dragged up to the surface of the water. We have thought that it might be worth while, particularly in crooked and difficult parts of a canal for hauling, and where rubble flow or gravel is in plenty, when a wide canal is cutting, to form the covering of the lining, or the facing of the bottom, and perhaps of the lower part of the sides also, of gravel or rubble instead of earth, and carefully to level and ram or roll the same down like a road, so that hitches might be used freely thereon as on the bottom of a river. There would still, however, require very strict and well enforced regulations, to prevent the walls of the bridges, locks, tunnels, &c. from being pecked and greatly damaged by the points of the hitches. Slide-rails will also be necessary, in and near the locks or tunnels, as we have mentioned in speaking of the Bilworth tunnel, which can, without damage to the walls, be removed, when decayed or worn out. Before we proceed to the subject, that has perhaps produced the greatest number of unparalleled mechanical inventions that are any where else to be found, we mean for making boats by an impulse from within or accompanying them, we have one other thing to mention, viz. that Mr. James Jordan, in his patent of the 24th of May 1796, for bridges, before quoted, has proposed the use of circulating chains across an aqueduct bridge, for towing boats over the same; and avoiding the expense of the extra width for, or lateral support of, a towing-path thereon.

The volumes of the machines approved by the Academy at Paris, and the cabinet of M. de Servier, printed in 1719, contain plates and descriptions of many different contrivances, designed for propelling or rowing of boats on canals and rivers; one kind of these, which we shall first notice, depends upon gaining an impulse or hold against the ground at the bottom of the river or canal; in one of which, a small boat moved by oars was proposed to be employed in successively carrying forwards and dropping anchors whose ropes were to be attached to a horse-gin on board of a barge, which was designed to tow or drag a great number of others. In another, a spiked wheel was proposed to roll on the bottom of the canal, attached by a frame moveable on hinges at the stern of a barge, where a roller turned by a wheel, was to give motion to the spiked wheel and propel the barge, by means of an endless rope or chain. See also Walker's Lectures, 4to. page 330. A second kind depended upon the same principles as an oar, except in the construction and mode of applying the power. On the 20th of July 1796, Mr. Thomas Potts took out a patent, for the use of a large flap or ear, moving on an horizontal hinge, upon a framed lever at the stern of a barge, intended when the handle of this lever was lifted up by several men, to turn on its hinge and project but little rellitance; but on the descent of the lever, its whole surface was by the action of the men at the lever, to be exerted on the water for propelling the vessel; see Repertory, vol. vi. p. 160. In the year 1801, Mr. Edward Steers took out a patent, of which we have seen only a short extract in the Monthly Magazine, vol. ix. p. 486, from which we understand his invention to differ but little from the above, except in having two paddles or oars. Mr. Robert Barlow took out a patent, for applying the principle of fluffer-boards or venetian-blinds to several purposes, which he has explained at length in his Essay printed in 1798; and at page 60, proposes to propel ships by large oars or fins of this kind to be hung on the sides thereof by hinges, and worked by a lever, as a rudder is by its tiller; poles with square frames fixed on their ends, to push against the water behind the vessel are also described. A third kind, depending on the reverse of the action of an under-shot water-wheel, lies had many advocates; the first that we have met with in our own country, is Mr. Thomas Savery in 1698, whose contrivances are shown in Harris's Lexicon Technicum, art. Engine; it consisted of 6 or 8 paddles like those of a water-wheel on each side of the vessel, fixed on an axis across the same, on which was a trunnell head, and under this a wheel working into the same, by the force of a capstan to be turned by men. We are told, that in the year 1751, the abbe Arnal proposed to apply the power of a steam-engine on board of a vessel, for working paddles, something like the above, we believe. Soon after this period, we remember seeing on the shore of the Thames at Wapping, a small barge with a water-wheel in a cavity in its stern with a steam-engine for working it, which was laid to be the contrivance of Mr. Stanhope, and had been tried with success against the tide in the river. In the year 1797, a vessel having rowers by its side, that made 18 strokes per minute, from the action of a steam engine on board, was tried on the Stanhope canal, by which it was propelled 10 miles and back again to the same place: see Monthly Magazine, vol. iv. p. 75. In the same year, Mr. Walker (the lecturer) made some experiments on the Thames at Reading, and caused a boat to row itself against the stream. See his Lectures, 4to. page 349. About the year 1820, Mr. H. Hunter and Dickenson took out a patent, for a propeller for ships, which was tried in January 1801, on board of a government sloop off Deptford on the Thames, and the ship thereby made way against the tide at the rate of three knots an hour. Monthly Magazine vol. xi. p. 195. In the Journals of the Royal Institution, about the year 1822, there is a description of an improved application of the steam-engine, to the turning of a wheel for propelling boats; the cylinder of this engine is horizontal, and the wheel with paddles is in a cavity in the stern of the boat, which therefore has two rudders, one on each side of the wheel, connected together by crosst reds. A vessel of this kind was constructed for the Forth and Clyde canal company, under the direction of Mr. Symington the inventor, and in a trial made in December 1821, it drew three vessels of 60 or 70 tons burthen each, at the rate of 2 1/2 miles per hour on their canal; see Agricultural Magazine, vol. vii. p. 152. We read in the late mentioned work, vol. ix. p. 218, that Mr. Robert Fulton exhibited a vessel on the Seine at Paris, in August 1803, having two wheels with paddles, worked by a steam-engine, and two other vessels were towed by it against the stream at the rate of 3 miles per hour. A fourth kind of boat propellers, has depended on the rotary motion of a ferret, or fliers like those of a fmaok-jack; Mr. Daniel Bute, in his attempts to navigate sub-marine vessels, as related in the Transactions of the American Philosophical Society, vol. iv. p. 523, used oars, placed near the sides and top of the vessel, formed upon the principle of a ferret, the axes of which entered the vessel, and by turning the same one way, the vessel was made to advance or descend, as it was to recede or ascend by a contrary motion of the ferret. Mr. John Vildler has contrived a vessel, which has been lying, and occasionally tried in the Thames at Wapping, for 2 or 3 years past, that has a bowm hung by an universal joint (Hook's) at the stern thereof, to a rotative axis, turned by a capstan upon the deck of the vessel; at the end of this bowm is fixed a circle of strong flyers, just like those of a fmaok-jack, which by stricking the water obliquely as the bowm is turned round, propel the vessel forwards; near to the flyers there is a collar on the bowm that turns easily therin; to this collar ropes are attached.
attached, which go to different parts of the helm of the vessel, and by which the boom, when in motion, can be drawn up quite out of the water, if its propelling action is wanted to cease on any temporary occasion, or if the ice thereof can be let down into the water to any depth which may be required, or be turned aside from the direct line of the vessel to steer her on any course, without waiting so much of the propelling power upon the rudder as is usually done in steerage; a rudder is however applied to the vessel ready for use when occasion may require. The fifth and last method, which we recollect to have seen or read of, consists in pumping water, by a force-pump through an orifice or pipe at the helm, or end of the keel of the vessel, with such force as to propel the vessel along, by the stroke of the moving column of water against the water in which the vessel floats; we are sorry that our memory does not serve us to mention the name of the inventor of this method, or the work wherein we saw a description of the apparatus. In the British Magazine, vol. i. p. 397, it is mentioned, that in the year 1805, a vessel was constructed at Liverpool with a steam-engine in it, which was moved along without the intervention of any machinery: we think this as likely to have been, an application of the pumping principle above mentioned. Although, as we hinted above, none of the mechanical contrivances here mentioned have been adopted in practice, we trust our readers will not be displeased, at the short notice which we have given of each, with a view to preserve their memory, and in hopes that the thing may yet be accomplished.

On the repairing of canals we think it necessary to say something; and to begin, by recommending the adoption of a system of management, by which the called notice of any defect, or want of repair, will be obtained: that in harbours, at proper places on the line, a flock of oak, elm, and deal timber should constantly be kept, cut out and felled, ready for replacing any of the timbers or planks in the locks or other works, with the least possible delay to the trade; a circumstance which, if not attended to, may prove of incalculable injury to the credit and success of the concern. Sound and good bricks, and stones, ready for replacing any which are liable, or offered to be likely to want repair, should also be in readiness, and good cement should always be kept in readines, on some part of the line from whence the quantity wanted may be speedily transported to any part where a repair of the walls, bridges, culverts, &c. may require the same: however, before emptying any part of the canal, or interrupting the trade for any repairation, a strict search should be made throughout every part in that level, or on the adjoining ones, to discover all the defects therein, that arrangements may be made beforehand for repairing the whole at once, or with as little delay as possible, while the trade is interrupted on the line. In every lock-house a considerable number of the pile-planks before described should be kept piled up in readiness, for making temporary flanks or dams, in order to empty any particular part of a level, which may have a culvert, trunk, sluice, stop-gate, lock-gill, or other thing which is damaged, out of order, or decayed. It is surprising, to those who have not seen such works performed before, with what facility the workmen who are used to this business will drive two rows of pile-planks so regular and close to each other, that by the help of the tongues or flaps in their grooves, and often without, a tight flank is made without any earth or other loose matters to float the water; and between two of these flanks, if such are necessary, they will empty the water, by chain pumps, or water-screws, to get at any culvert, or other matter, to be repaired or altered; there have been instances of these operations being performed, and of the part being filled with water, and the plank-piles drawn up again for the trade to pass, in the space of eight or nine hours. Should any part of the canal appear to want new lining or puddling, owing to a neglect at the time of making of the canal, or to any subsequent accident, care should be taken to choose the time for such works, when the trade can best bear an interruption; and as, on the average of seascapes, the trade is in two or three weeks interrupted by ice; during the months of January and February, it may not be amiss to embrace that period, on some occasions, although the work may be longer after; and some additional expense may be incurred by covering up the work with earth, before it is left at night, to prevent its freezing, and in removing all such puddle, &c. again in the morning, or at beginning work, which shall be found frozen. Precise and explicit notices should be given of all intended interruptions to the trade, as long beforehand as is necessary, to enable the traders to supply stocks of articles at the places of consumption on the line, and to avoid having their barges locked in, and perhaps lying idle, when they might have been employed if they had been on a different part of the canal.

It is an essential point of good management to have experienced mole and rat-catchers employed from time to time upon the line of a canal, to extirpate these hurtful vermin; and in every instance of discovering one, to trace out all his burrows and holes, and have them carefully filled up and filled in every part, as well for preventing the haubouring of other animals of the same sort, as for preventing the water from making its way into and through them. On a canal in Surry, we are told by Mr. Robert Marshall, in his examination of a canal and road, &c. that a mole or rat hole only, occasioned, after the hard frost of 1795, the rupture of the canal in a high embankment, by which more than 100 yards in length of a lofty bank was precipitated into the meadows and river below, and that a large which before lay enveloped in the ice on the canal, was hurried down through this gulf into the river! It is impossible to take too much care against such fatal disasters as these, and the duty of the mole and rat-catchers ought not to be limited to the company's ground, but in all fields, banks, ponds, or brooks within 200 yards or more of the canal, on each side, they ought to be equally attentive to the destruction of such vermin, and the demolishing of their secret retreats. The same men might very properly be employed in pulling up and extirpating all large and spreading weeds from every part of the banks of the canal, and in mowing down the herbage occasionally; these circumstances being not less essential for the neatness and beauty of the canal, than to prevent the first harbour of vermin of different kinds. The banks of the canal will be very apt to continual wear at the surface of the water, and for some height above and below that level, if a proper kind of herbage is not encouraged upon the slope of the bank: considerable care should be taken to suffer no plants to take root on or near a canal bank, or spread its seeds, (if possible to prevent it otherwise,) as the water, even when it flows by a feeder, which will grow in deep water, or whose roots are large, hollow, and strike deep into the ground, left the former of these should choke the canal in time by weed-beads, and the latter render it leaky by the formation of numerous open tubes through the lining into porous stuff. None but those who have seen many drains or new ditches opened in wet and boggy ground, can be aware of the depth, size, and number of hollow roots, which some of the aquatic plants, as the equisetum palustre, or marsh horsetail, the iris pseudacorus, or yellow flag, and several others, send forth into the ground.

Paddle-ditches, in the banks that are raised or made up, are a great security against the bank being washed down, in
in case of the water, often by any sudden thunder-flower, or
other inordinate rain, breaking over the top of it; as soon as
the puddle is reached, the effect of the stream to tear and lower
the bank will often be stopped; for good puddle, when pro-
perly let and hardened in the centre of a bank, is so compact
as not to be liable to be broken or suddenly worn by a
current of water. In case of the breaking or flooding of a
bank, in that a considerable and wide breach is formed, and
still increasing, it is a good practice to drive in two rows of
common field hurdles, at a feet or less apart, filling the same
two together by cart and securing them by strong stakes
drove down behind them, and if the stream of water be deep
through the breach, it will be necessary to drive other long
stakes obliquely into the ground, and securing their tops to
the hurdles and upright stakes by lops of cord, that these
hurdle may act as struts to prevent the whole being borne away
into the cavity between the hurdles; straw or hulks should
then be put and trod down, beginning at each end, and
working towards the middle, in order to prevent the current
being turned, with fresh impetuosity, against the sides of
the breach; such a dam as this will prevent the loss of any con-
fiderable further quantity of water, and will render the water
free from, so that a row or more of pile-planks can be drove
to cut off the connection with the breach, which can then be
emptied of water, the hurdles and straw removed, and the re-
paration begun, with proper puddle-ditches for its security,
as before described. At the famous Dagshahm breach of
the embankment of the Thames, dove-tail, or plank-piles
were used, we are told. It will be necessary to defend many
places of the banks of a canal that are obliged to be untimely
swept, as in the approach to a bridge or lock, a weir, &c.,
with a facing of planks, called 

camp footing; this consists of
strong piles driven into the bottom of the canal, with the
proper inclination, with horizontal pieces, or land ties to
their tops, on to which piles found and durable planks are
spiked. In some places, owing to the accidental or unavoi-
dable admission of very thick water into a canal, or in more
cases by the ordinary deposit in length of time, the canal
will become choked with mud. In these cases a machine
with buckets, like a chain pump, to siphon the bottom of
the canal, and afterwards discharge the load of mud into a
barge, might be used, such a machine, worked by horses,
having now in use in the 

West India Docks. See also Walker's Lectures, 4to. p. 35.
The late Mr. Brindley, we are told,
contrived a plan for the purpose of clearing the docks at
Liverpool from mud.

By neglecting it will sometimes happen in canals, that 
Weeds

grow up from the bottom, and form an insufferable imped-
ment to the motion of the barges; and this is almost unavoid-
ably and generally the case in river navigations, if careful care
is not used to tear them up, or cut them down. On the great
Ouse, and other river 

canals, a machine has been long in use,
called a 
hearinng, for tearing up strong weeds by the roots.

About the year 1796, the 

chevalier Bentenouce Molina

presented to the Society of Arts, a model of a barge, having
a windlass in its stern, which gives a circular motion to a pair
of knives or scissors, or a lever giving an alternating motion
to knives for mowing off weeds close to the bottom of a

canal, in which the barge is to float, or on the sloping sides
of the canal; for which purpose, the knives can be made to
revolve at any depth below the surface of the water, and
either horizontally, or inclined in any angle; this model may
be seen at the society's house in the Adelphi, and a descrip-
tion and view of it will be found in their 

Trans. of the R. A. vol.


In molt winters it hap-

pens, 

that an ice not more than an inch or an inch and half

thick, continues for a considerable length of time on canals,
and other flagrant waters; this, or even a leaf thickness of ice
is sufficient to stop the trade upon canals, unless the ice is
broken; and, for this purpose, it is advisable, every morn-
ing of a frost, unless the ice should be found more than usually
thick, and the frost increasing, and likely to continue,
to break the ice on each pound; this is usually and effectually
done by a strong and square headed barge, whose floating or
projecting head is covered with strong iron plates. One of
these barges being drawn along the canal, and into each lock,
by several horses, has a constant tendency to rise up upon
the ice, and thereby breaks it down before the barges: about
the lock-gates it will be necessary to break the ice by flamp-
ring with the end of a pole. Mr. Symington, whole barge,
with a 

steam-engine in it, to propel it along, and tow other
vessels, we have lately mentioned, has provided the head
of his barge with flammers, to be worked by the engine, for
breaking of the ice before it, in frosty weather.

Leaks in a canal may sometimes be stopped without em-
ptying the water, if the depth will permit it, by preparing
good puddle in a flat-bottomed daw-bath or flat, and
dropping the fame in spadefulls equally over the surface, and
when a certain length is done, taking the fame about with a
rake, with short teeth to join the pieces together, and level
the bottom. The difference in specific gravity, in different
loams and earths, is so considerable as to make some of them
much more proper for the lining and facing of a canal than
others; the heaviest that can be found should be used when
leaks are to be stopped, and the water remain in the canal as
above. We have passed along the branch of a canal on a
chalk foil, where the lining of the bottom was fo light, that
the motion of the barge filled enough of it up into the wa-
ter, which was before nearly clear, to make it almost as white
as milk behind us; this light stuff has since been taken out,
and a substantial lining and facing of proper stuff brought in
bars for the purpose, and laid on the bank before the water
was let out, has been applied, by an able engineer, who suc-
ceeded those of too different a description who constructed
this very leaky branch.

Some Implements and machines are used in the making or
working of inland navigations, which we have not had occa-
sion yet to mention or describe. In every considerable work
it will be necessary to erect rolling-dones for grinding and
preparing of the cement or mortar that is to be used in the
waterworks. As Westley, on Bridgewater's canal, the
power of a water-mill is applied to turn two pair of
large stones on edge, like those used by tanners, gunpowder-
makers, &c.; in some of those the stones rested round on a
fixed stone, in others a large cast-iron flat pin, in which the
materials to be ground were put, was turned round under the
stones, which were thus made to revolve round their own
fixed axle on the materials. What appeared singular in the
proceeds at this place was, that the lime and other ingre-
dients were ground with water for a long time, in the flat
of thin mortar, which was then removed into cisterns to dry,
and before the flame was become too hard, it was cut out by
a spade, into lumps of about half a cubic foot each, and
heaps of them were preferred in a fire-room, where they be-
come quite dry, and as hard as chalk, or harder, for use at
distant periods of time, in the repairs of the walls and works
under water. At the 

London and 

E. India docks steam-
engine, of twenty horse power in one cafe, were used for
grinding their cement; but the pozzolana, lime, and other
ingredients are here mixed and ground together in due pro-
portion in a dry state (as Parker and Co.'s patent Roman ce-
ment is done), and it is not wetted, but carefully preferred
from
from mole, till a very short time before it is to be taken in the wall. See "The article Rolling-hous." The driving of Piles is a very considerable business in many large concerns; at the entrance of the London Dock a steam-engine was erected for driving the vast number of piles which were required for the cellars. Mr. S. Bunce contrived a very simple and effective kind of pile-driver, to be worked by men at a wheel. M. Hervet contrived a double pile-driver, which is described in the "Transactions of the Society of Arts," vol. xi. p. 177. The double pile-driver contrived by M. Painbow cannot, from the small immensity of models, plates, and descriptions, which have been printed of it, since the building of Greenwich Bridge, be unknown to any of our readers. Mr. J. P. Volland contrived a machine, and perfected a model of it to the Society of Arts, (see their "Transactions," vol. viii. p. 282) for cutting off the tops of piles after they have been drove, beneath the surface of the water. See the article Pile.

Some of the navigator's tools and implements, as barrels, huling-blocks, grating-tools, floats, and compasses, have been represented in figs. 14 to 32, "Canals, Plate VII.

Cranes for the hoisting of goods will be required on the wharves of canals and rivers. See our article Crane.

On the general management, and office department, of a canal concern, it is unnecessary to enlarge. The committee with which the conduct of it is entrusted will, without doubt, direct their attention to those various circumstances on which its prosperity depends. Accordingly, they will appoint proper officers in the several subordinate departments, and give them such instructions for the regular discharge of their duty as occasion may require. It may not, however, be improper to suggest, that the canal committees should direct their resident engineer to establish proper rain and evaporation gauges at several lock-houses upon the line, to be kept by the lock-keepers, and register daily or weekly with great care: these observations, preferred in the company's books, or, what would be better, published in some of the magazines, would prove of great advantage to mariners, and to canal undertakings in general. In canals of considerable length, particularly if some parts of them are indifferently supplied with water, or leaking, it will be right to fix gauges or graduated rods on each upper lock-gate, that shall show at all times how many inches depth of water there is at the time, in the shallow part of that pound; and to cause the lock-keepers to mention the same at the foot of the printed permits or pass tickets, that the toll-keepers should give to every barge-man who passes, containing the number and description of each barge, and the description and weight of its load; these, transcribed regularly to the toll-collector, would enable him, or some other person, to keep for the information of the committee, a register of the daily state of each long or leaky pound of water; at the same time that the lock keepers, toll-keepers, &c. at each extremity, and on different points of the canal, would always be acquainted with the state of the water, and the loading which a barge could pass with at every particular place; and could inform bargemen; for want of which knowledge great delay and expanse are often incurred, in dry seasons, by letting off with more lading than can be carried through, for want of a sufficient depth of water, and part of the same is obliged to be left on the road, or taken into other boats. All the regulations contained in the act, for working of the canal, and such by-laws as the committee may find it necessary to make, for regulating the conduct of the bargemen and others on the canal, should be printed, and stuck up at every whirl on the canal, and in every toll-keeper's house; and all the company's agents and servants shall be made acquainted with the rules and regulations, not by alteration in the place, but by immediate notice, in writing or otherwise, and the particular of the time, place, and name of the barge, or under which ladder or whistle it is made, or any other proper particular, is to be given verbally, and recorded: and, though we speak of the toll-keeper, whose duty is punishing on that subject, yet a little on the line, by showing the officer on the line the committee would be prepared to proceed against it; and, we may say, particularly if the parties were written to, to them, and not to the toll-keeper, to prevent the barge-passers from being informed, the report was sent to the company.

Tollage Tickets, fully and explicitly stating the toll or tonnage payable to the company, its agents, or articles of every different kind, on different parts of the line, if often happens, these vary, should be printed, and stuck up at all the wharves and toll-houses, for preventing all doubts or alterations between the company's servants and the traders. At some convenient place on the line of the canal, a weighing-place should be prepared, consisting of a dock, yard, and wharf, large and deep enough to contain the largest vessel which are to navigate the canal; this dock should be furnished with a draw-bridge to let down, or doors to fast, when an empty barge has entered, in order to regulate the water quite full within the dock. Gauges, or laden weights of 2 cwt. each should be provided, and a course to hoist the weights readily in or out of the barge, and place them in any part of the same, so as always to load her evenly. To this weighing-place, the act or by-laws should require every barge to be fast, have the name thereof, and the owner's name and residence previously painted on the item of it, before it is allowed to trade on the canal: the empty barge, being arrived in the dock, the gauging-matter fixes four small plates of iron, each containing the number that this barge is in future to be distinguished by, two on one side, and two on the other, against the grapple, near the head and stern. These plates are all fixed at the same distance from the surface of the water, when the barge is empty; this distance, in inches and tenths, is entered into the gauging-matter's book, under the number of the barge, name, owner's name and residence, date, and other particulars: two tons or weights are then hoisted into the barge, and regulated until the distance from all the four plates to the water's surface is the same, which distance in inches and tenths is also entered in the book against two tons; two tons more of weight are then hoisted in and adjusted, and the height of the number-plate above the water is taken, and entered against four tons as before; these operations being repeated until the utmost lading of the barge is on board, when the weights are taken out again, and the barge removed from the dock. For measuring the height of the plates at the Paddington weighing-house, a tin tube is used, that is furnished with a float moving freely in it, to mark the surface of the water, which carries a light float graduated to inches and tenths, to show the height of the number-plate against which it is applied. At every toll-house on the Grand Junction canal similar floating-rams are kept, and to every laden barge which pays this gauge is applied against the number-plate, at each end, and to those on the other side, if the barge appears to heat at all to either side. If the dry inches and tenths shown by the gauge, between the number-plate and the water's surface, be different, they are added together, and divided by the number of them for the mean height. It is the business of the gauging-matter to calculate, from the particulars entered in his book, of each barge as above, the weight to the nearest of 1/10 of a ton, which answers to every inch and tenth.
...
The Principles of constructing River Navigation require some further notice in this place, in addition to the particulars which we have already had occasion to notice respecting them in this article.

Mr. Thomas Telford has given an account of the navigation of the river Severn, which is printed in "J. Thelwall’s Agricultural Report of Shropshire," pages 284 and 317, from which we shall collect some particulars, and remark thirteen, with the view of paving an example, what are the nature and extent of the difficulties which navigation has to contend with, upon natural rivers. This fully famous river is navigable up to Wrekinpool, a distance of 155 miles by water, from the mouth of the Bath Avon river; the extreme branch of this river may be traced for about 45 miles above Wrekinpool, to Philominham Hill, and numerous other branches extend for great distances into the country on both sides; the whole of this great length of river navigation was till lately unimproved by art, it having no locks, weirs, or other excisions throughout its whole length for surmounting the numerous shallows and irregularities, which the current over variable 

The greatest trade is carried on the canal, in the shape of merchandise, goods, and manufactures, that are conveyed from one place to another, by means of which commodious and convenient means the commercial intercourse of England is still more favored; and the pleasing and healthful agreeably to natural rights, and respecting their rightful and honest claims; and the navigation of the Severn river is no exception to this rule.
gations, or in extending the navigation thereon above the tide-way, it is of importance to examine the state of the whole country, to which the river in question acts as a drain, to observe accurately whether cultivation, or the breaking up of lands, and the practice of draining have been going on, or are likely to be so in any considerable degree, within a reasonable period; as also to observe particularly the state and extent of the valleys and meadows, over which the waters are or have been spread in ordinary floods, and the probability of such being further prevented byBrightening or enlarging the beds of the brooks and rivers, or embanking the courses of the streams; these, with the most correct information that can be obtained from different millers and others, who live on the banks of the river, or from scientific individuals, who have caused accounts to be kept of the height of the water, will be necessary data for determining the magnitude and nature of the works which will be necessary on the proposed navigation.

Mr. William Chapman, in his Observations, often before quoted, page 74, when treating of the canals of China, which are in effect but new channels for a part of the streams of China, occasioned by the floods of the Yen, has referred to observations on the crookedness and unequal factions of rivers, and on the effects of shallows, weeds, and other impediments, upon the velocity and height of the streams, that we must reluctantly for the present pass over, referring the reader to our article RIVER. As an influence of the fall and velocity of large natural rivers we are told, that the Ganges for 60 miles, having the mean width of 3-4ths of a mile, and depth of 15 to 20 feet, was found to have a fall, in a direct line, through the immoveable flats and rice-fields on its side, of 9 inches in a mile, but by following all the bends of the river's course, the fall was reduced to 4 inches per mile, and its velocity therein did not exceed 3 miles per hour. On ascertaining really the velocity of streams of water, and comparing the same with theory, see Nicholls's Journal, Bro. vol. iii. p. 52 and 87.

Mr. William Chapman seems to incline to the opinion, that locks may not always be eligible on river-navigations, and says (p. 74) that "during the flooded state of rivers, all small falls are equalized, as they necessarily rise higher below than above a rapid; therefore I am far from saying, that running canals with a small fall are not, in many instances, eligible on the shores of great rivers; and that well devised flops, easily opened and closed, (not such as lift up like the slips described in China, nor open against the stream as gates,) are not sometimes preferable, to impeding the fall of the locks. In other nearly similar instances where locks are eligible, their piers and gates alone, will be sufficient without any other floor or tide walls, than a concave and battered pavement, continued through the bottom and up the sides of the space between the piers. The eligibility, and the particular construction of these works, will much depend on the nature and extent of the beds of the rivers, the difference between their low and flooded flats, the height and also the permanency of their shores, and the quantity of floating ice.

The greater number of rivers through which new navigations are now required to pass, will be found occupied by mills, at shorter or longer distances from each other, according to the fall of the water in most instances; at the tail of most of such mills, will be found a large and deep pool, which the fall of water from the mill-courses and flood-gates has torn and excavated, and a short distance below this pool a shall or bed of gravel. or other materials, will in general be found, that would prove so expensive to remove, and would in general be so subject to accumulate again by a further excavation of the pool from the increased fall of the water into it, that it will in general be the cheapest and most effectual way to begin a new cut for the navigation below this flood, and continue the same up by the side of the pool to the bank of the mill, wherein a pound lock must be constructed, either of timber or masonry, for gaining the ascent to the mill-dam or upper pound. In rapid rivers subject to great floods, the utmost care and attention of the engineer to the construction of such works will be necessary, to prevent their being demolished by the flood perhaps after their erection. Where mills do not intervene, and rapid and of course shallow places occur in the bed of the river which is to be made navigable, a side-cut must be begun from above such shallow, and if practicable at the beginning of a considerable bend of the river which the side-cut may cut off and shorten; in continuing this side-cut downwards towards the place where the lock is to be placed, and the junction below the same is to be formed with the river below the shallow, care must be taken to conduct the side-cut, which is to be upon a level as far as the lock, as soon as possible across the flat meadows to the borders of the high ground, where it should skirt, to the summit of the lock; this is practicable, on account of the width of the meadows, otherwise a counter-drain or parallel cut must be taken up from below the lock, as far as is necessary, on the land side of the side-cut, to drain off the water, and prevent a swamp or pond being formed above the lock and between the side-cut and the high ground, as is almost invariably done by the ancient mill dams on most rivers and streams: it is, however, with the utmost care and precautions that the counter-drain should be adopted, otherwise, in time of floods, when the meadows are overflowed, such a current would rush into and down the declivity of the counter-drain as to endanger the bearing thereof, and of the bottom and sides of the cut or bed of the river, into which it vents below the lock. We have seen large and expensive sluices erected upon and near to the vent of counter-drains circumvented as above, of greater height than the top of the floods, which were found necessary to be built, and kept shut on the approach of a flood to prevent the action of the counter-drain, until the flood had subsided so far as not to overflow the meadows adjoining the counter-drain. Across the bed of the river at the most convenient place below and near the upper end of the side-cut, an opening-weir must be constructed, by which the water in the river can always be kept at a proper height for covering the shallows and bed of the river, and to a proper depth for the navigation; several of these opening-weirs have within these few years been constructed on the Thames, one of which near Windsor has been described and drawn by Mr. Zach. Allnutt in his Considerations on the left Bank of improving the River Thames, 1807, p. 22. It consists of several strong piles or posts driven firmly into the bed of the river at 20 to 25 feet apart, in a straight line across the river: the intervals between these piles are driven and nicely filled up with lug-piles, or dovetail piles, as before described in this article; these last are afterwards faced off straight and even with the bottom of the river, and have a strong and found nail nicely fitted and spiked on to them, and into each of the large piles at its end; by this means the water is prevented from leaking or making its way, except through the rectangular openings between the several piles, which should be as least as high as the highest floods, and have their tops connected by strong crofs pieces of timber bolted on to them: these crofs pieces, and in the fill below, a number of holes are prepared for placing at equal intervals as many upright pieces of wood, called timbers, with rebates in their sides, for
for temporary gates to slide down in, and refill against; after these riners are put in, a sluice or gate, with a tall handle to refill against the upper, or crost piece, is put in between each riner; and, above these, another set of gates, called overfalls, with similar handles, are fitted, to be occasionally used in dry seasons, when none of the water is to be suffered to escape, except by the tide cut and lock-paddles. In time of floods, all these gates, overfalls, and timers, are taken away, by persons who go in a boat for that purpose; which operation, we are told, can be performed in three hours, and the water is suffered to take its free course through the openings: the water subdues, a few of these gates are put in at a time, leaving the water its course through the others, until all of them are in, when on any small fall of the water, the same falls over the tops of these gates into the bed of the river below; when a greater depth of water is wanted above, the overfalls or upper gates are faced directly put in upon the others; these fall being of such a height that the water can fall over their tops before it would overflow the meadows in case of its rising, and the men not attending or being expeditions enough in taking away the overfalls, and then the gates, if the proper rise of the river should need it necessarily. Mr. J. Rymer in his report before quoted, page 316, has given a plate of a weir of this fort for a river, which is called a gate sluice, with 17 gates, but we have looked in vain for any description or account thereof in his volume. In the Thames and several other rivers, Jetters, or Weir-bridges have formerly been made, for diminishing the width of the river below the several shoals, in order to make a deeper but narrower and more rapid current over the same, as is done, we are told, on the China canals; but the rapid and dangerous currents which these and the under-water weirs occasion, particularly in high water times, have been so justly and loudly complained of, that we trust the same will, ere long, give place to the side-cuts, pound-locks, and opening-weirs, above described. The principles on which jettries are made to raise the water in rivers, and the mode of calculating their effects may be found in Nicholson's Journal, Svo. vol. ii. p. 35.

For improving the navigation of rapid, confined, and variable rivers, like the Severn, Mr. Thomas Telford, in 

Plymley's Report, p. 187, has recommended the deepening of the lower part of the bed of the river in the shallow places, in order to equalize the declivity and current of the river: a very experienced engineer has suggested, that deepened shallows, without jettries or similar constructions, would soon be again filled up in many places. In the higher parts, Mr. T. proposes to erect solid and durable weirs of masonry across the river upon the shallow places, with side cuts and pound locks by the side of them, for the navigation; and the river when thus directed may, as he justly observes, be applied to many important purposes of machinery, and for irrigating of the meadows, which would thus be brought within its reach. There is no doubt but this method is practicable, and would ultimately answer well; but the expense would be very great of erecting substantial weirs, and making the banks of the side-cuts, and walls, and gates of the locks, high enough to prevent the floods from breaking over into them, a condition which seems necessary, if barges are to be able to proceed at all times, the towing-path should also for the same purpose be made up with a regular sloping bank next the river, presenting no inequalities or projecting objects to catch or wear the towing-lines, so that its top or path shall be always above water. On a river which rises 16 or 17 feet or more, these works would be attended with a most tedious expense and difficulty, particularly where cliffs rise almost perpendicularly up from the bed of the stream. Machinery on such a stream, unless great expense indeed was incurred to obviate it, would be subject to have its work interrupted by every large flood: the working of barges on a river with such cuts, locks, and towing-paths, as we have mentioned, would be attended with considerable difficulties; tall masts must be used for attaching the towing-line in dry times to bring the hou on a level, or nearly with the barges, and in floods it must be fixed lower down, or to a shorter mast; and, in such cases, the utmost care might not always be able, where the works are necessarily confined by rocky banks, to prevent barges from sometimes missing the entrance of the side-cut, and being precipitated down the current over the weir, and being sunk. A towing-path, locks and banks of a level height, so that the floods would frequently cover them, besides their being totally useless in such times, would be liable to be damaged and washed away, (unless constructed in the most careful and expensive manner,) and the cuts and locks to be filled up in a great measure by land, or gravel, in rapid rivers.

Mr. William Reynolds gives an example which has since been followed, on a great length of the Severn's bank, of constructing a towing path for barges, instead of the devious way over projecting rocks, hilly lands, mud, and every other obstacle which the men who used, from time immemorial, to perform the flave-like office of hauling the barges along, were obliged to travel: we are not acquainted with the height of these new towing-paths, or whether they are at times, and how frequently, covered and useless by reason of the floods. Mr. Allbutt informs us, that one horse commonly tows a barge of 130 tons burthen down the Thames above Richmond, at the rate of two and a half miles per hour. While on the running canals of China, or George Staunton observed a boat of a light construction, with only 1.4 tons lading, of eight feet width of floor, about 10 feet width of water-line, and 50 of extreme length, drawing two feet three inches of water, and sharp at the ends, dragged against a stream whose whole velocity was 54 English miles per hour; and, although there were 28 trackers, or men hauling at the hou fastened to the boat, besides three men in the boat pulling it on, it advanced only at the rate of 4 of a mile an hour; although the channel was not materially constructed in either width or depth of water-way, in proportion to the section of the boat. Mr. Thomas Telford has (p. 288.) proposed another method of improving the Severn river, by collecting the flood waters into reservoirs, the principal on of to be formed among the hills in Montgomeryshire, and the inferior ones in such convenient places as might be found in the dingles, &c. along the banks of the river. By this means, the injuriousness of the floods might be greatly lessened, and a sufficient quantity of water preserved to regulate the navigation of the river in dry seasons, and likewise to answer many other useful purposes, such as the forming ponds for inland fisheries, the supplying of artificial canals, and the watering of land. This, it is thought, might even prove the simplest and least expensive mode of regulating navigable rivers, especially such as are immediately on the borders of fully countries." An engineer of the first reputation in his profession (Mr. Rennie,) intimates, that after what has been said respecting the extent of flood water in the river Roch above the ordinary supply, the idea of correcting the floods of the Severn by reservoirs, must appear to be ridiculous. Mr. William Jeffery, on another occasion already referred to, says, that the rivers may be rendered nearly uniform throughout the year by reservoirs.

The old clumpy stone or brick bridges upon rivers are a very principal interruption to the navigation thereon, by preventing the continuation of the towing-path in a place where it generally took effort to surmount the rapid fall occasioned by the contracted water-way under the

bridge;
bridge; the masts of vessels are also obliged to be struck. These
circumstances recommend the more general imitation of the
spirited individuals near Coalbrookdale, who have erected
two iron bridges over the Severn, which, single and capa-
cious arches remedy these evils. We have already spoken
of them under the article Bridges, and in the present one, and
therefore proceed to the only remaining subjects that at
present occur to us, relating to the deepening of rivers: the leav-
ing of boughs, or taking up of sand, gravel, or other loose or soft
matters from the bottom of rivers, is usually performed by a
strong pole, having a flat ring or hoop of iron fixed on its end,
to which a strong leathern bag is fastened, like what is called a
landing-net among fishermen; or for taking up gravel only,
a fine and strong net is used instead of the leathern bag; the
edge of this hoop is made sharp, so as to strike into the bot-

Canal.

Pressing the method of arrangement, we found it in
expedient to follow those who have attempted to give an ac-
count of some of these concerns, in the order of time in which
they were projected or begun; because so many of them, in
distant places, were projected at the same periods, while some
were quickly begun and completed, and others re-
mained a great while in hand.

The great length of force of these works or undertakings,
the thrifts of others, their various directions and their ge-
neral and multiplied interections with each other, rendered
any geographical arrangement of them, as from north to
south, or otherwise, equally difficult and improper. We
thirll, therefore, that our readers will approve of the plan
which we have adopted, of giving the whole of these un-
terakings, rivers, canals, railways, &c. in one alphabetical
series, arranged according to the incorporate or parliamentary
name of each, where the same are under special acts of par-

Aberdare Canal. This undertaking was begun under
an act of the 3d of Geo. III.; its general direction (begin-
ing at its lowest end, as we shall always do in these descrip-
tions) is about N.W.; it is 7/4 miles in length to Aberdare,
hence an extension thence, in nearly the same direction, by a
rail-way for 1/4 miles further; it is in latitude in the county of
Glamorgan in South Wales, and is not far from the sea-coast,
very greatly elevated above the same. The great coal and
iron mines, and works near Aberdare, Fermo Vaughan, &c.,
with its principal objects, begins in the Glamorgan

Aberdeenshire Canal. Acts 56 and 41 Geo. III.—
The general direction is about N.W. for 19 miles in length, in
Aberdeen county in Scotland; it is near the sea-coast, and is
greatly elevated in any part; the principal objects seem the
supply of the town Aberdeen, the exportation of granite stone
from the famous quarries on its banks, and to form a communi-
cation between the harbour of Aberdeen and the vales of the river
Don. It begins in the tide way in the Dee river in Aberdeen
harbour, and follows the course nearly of the Don river,
in which it terminates at Inverury bridge; and passes the pa-
rishes of Old Machar, Newhill, Dyce, Kirmelady and Kin-
tol.
The river is 170 feet by 17 locks; the width of the
canal is 20 feet, and depth of water 14 feet. The harbour
of Aberdeen, (connecting with the Dee river near its mouth,
at the S.E. end of this canal), was surveyed many years ago
by Mr. John Sawant, and lately by Mr. Thomas Triffor, who
has, in his reports to parliament, recommended making
it capable of receiving ships of 14 or 20 feet draught of
water. It appears that this canal was completed and opened
in June 1807. The company might by the first act raise
50,000l. shares 50l. each; and by the 2d act 20,000l. more
might be raised on 20l. shares, bearing 5 per cent. interest.
Half-mile locks to be erected. Pleasure-boats of twelve
feet long, and four broad may be used on the ponds.

**ADUR RIVER.**

The general direction of this river is nearly
east for 13 miles in the county of Suffox: its objects
are the import of coals, deals, &c., and the export of
farming produce. New Shoreham and Steyning are
considerable towns on or near it. It commences in the sea at
Southwick below Shoreham harbour, and terminates at
Bines-bridge in Welf-Grinstead. In September 1807, notices
were given of the application for an act for extending
this navigation from Binesbridge to Baybridge in Ship-

**Alford and Wainfleet.** In July last (1803) a survey was
ordered for an intended canal from Wainfleet haven to the
town of Alford, the general direction of which line is nearly
north, and about 12 or 13 miles in length, in the county
of Lincoln: this line is near the coast, and seems but very
little elevated above the sea: its principal objects from the
supply of Alford, and the export of husbandry produce: it
is proposed to pass the town of Burgh. Wainfleet
haven is said to be a very good harbour for trading ships.

**ANCOLME NAVIGATION.** Act 42 of Geo. III. — The
general direction of this navigation is nearly north: it is al-
might straight (except the last four miles), and about 26
miles in length, in Lincolnshire. It is situated within
15 or 20 miles of the coast, and runs nearly parallel thereto
through towns and level grounds for great part of its length.
Its objects, besides a better drainage of the sea fens by a wide
and straight cut, instead of the old course of the river
Ancolme, seems the supply of Market-Raisin of
and of Cailor (by means of the Conflar canal, which joins it
at South Kelsey), and the export of husbandry produce.
It begins in the tide-way in the Humber river near Wintrin-
gham, and extends to the town of Market-Raisin, passing
near the town of Brigg.

**ANDOVER CANAL.** Act about the 50th of Geo. III.
Its general direction is nearly north, and pretty straight,
following the course nearly of the Aton river (which is na-
vigable to Runyem) for 22° miles in length, in Hamp-
shire; it is near the coast, and not very greatly elevated
in any part above the level of the sea. Its principal objects
seem to be to supply the country, and to export its surplus
of farming produce. It connects with the Southampton and
Suflbury canal, the latter entering it at Red-bridge, and leav-
ing it again at Kimbridge mill. The town of Southampton,
being its fourth end, is the 6th in the order of British
population, having 7,915 inhabitants. This canal begins in
the tide-way in Southampton-water at Redbridge, and termin-
ates at Barlow's mill near the town of Andover; the
towns of Runyem and Stockbridge being on its course. Its
rise is equal to 176 feet, and it is fed at its upper end
from Pilhills brook. This line was surveyed by Mr. James
Brindle in the year 1770, and an act proposed, but the
opposition of the land-owners prevented one being ob-
tained, until it had been again surveyed in 1789, by Mr.
Robert Whitehough; in a few years after which it was com-
pleted for use.

**Ashtow and Ouse.** In 1799, Mr. William Chapman
surveyed the vale of the Ouse river in Ireland, and recom-
mended to render the improvement of Ashtow harbour,
which was then intended, more beneficial to the adjacent
country, by connecting therewith a system of small canals in
the rapidly ascending vales of the Ouse, by rising 70 or 75
feet at once in proper places, by some of the substitutes for
locks, of which we have before spoken.

**ARUN RIVER.** This navigation has nearly a north di-
rection for 15 or 16 miles in the county of Sussex. To sup-
ply coals, and export farm produce, from its principal ob-
tects; which are facilitated by the Arundel canal, that joins
it near Stopham bridge, and would be further accomplished,
were the Sury iron rail-way extended to it at Wilborough-
green bridge, as was proposed in the year 1801. It pro-
cceeds from the sea at Arundel haven to Wilborough-green
bridge, paffing the town of Arundel in its course.

**ARUNDEL CANAL.** Act 31 of Geo. III. — The general
direction is west for about 11 miles, following the course of
the river Rother, in the county of Sussex. It is about 12
or 13 miles from, and nearly parallel to, the sea coast, above
which it is but little elevated. The supplying of the inhabi-
tants with coals, and exporting of husbandry produce, from
the principal objects of this canal. It commences in the
Arun river near Stopham bridge, and terminates at the lower
plats near Midhurst, with a side cut of about one mile in
length to Haslingbourn bridge in Petworth parth. The
line being through the parishes of Stopham, Coldhawtham,
Burley, Fittleworth, Erqdon, Coates, Sutton, Petworth,
Dunfton, Burton, Tillington, Lodworth, Selham, Arundel,
Eafebourn, Woolavington, and Midhurst. This canal is the
property of that public spirited nobleman the earl of Egremon,
but open to the use of the public, on pay-
ing certain specified tolls.

**ASHBY DE LA ZOUCH CANAL.** Act 34, Geo. III. — The
general direction of this canal, though in a serpentine
course, is nearly north, 40 miles in the counties of War-
wick, Leiceliller, and Derby. It commences near and
almost upon the grand-ridge on its eastern side, and near its
other extremity is tunnelled through a yet higher side-branch
of the great ridge. The conveying away of the coals and
lime-stone from this last ridge, and the supply of the towns
on its borders by means of the Coventry canal, with which
it connects, are its principal objects. Coventry, which is
near it, is the 24th town for population in Britain, having
16,054 inhabitants; while Hinckley, which is upon the line,
has 5,970 persons, and is the 120th in order. Market Bof-
worth and Ashby-de-la-Zouch are other considerable towns
near or on the line; the commencement of which is at
Marston bridge near Nuneaton, on the Coventry canal, and
the termination is by a rail-way (of 32 miles) at Ticknall line-
works; there also is a rail-way branch of 62 miles to Cloud-
hill lime-works; another to Mr. With's Nenham colliers
of 3 miles: a cut of 24 miles to Swadlingcote coal-works;
another of 2 mile to Staunton lime-works; another is to be
made to Staunton-Harold park (if desired by the earl of Ter-
ers, the proprietor thereof); and there is another short cut of
200 yards to Hinckley wharf. The first 33 miles of this ca-
nal are level, extending to Oakthorpe engine on Ashby woulds,
and forming with parts of the Coventry and Oxford canals,
a level of 73 miles in length, being, without the branches, the
longest in the United Kingdoms, and rendered more singular
by being on so high a level, as to crofs the grand ridge with-
out...
CANAL.

out a tunnel. From Oakthorpe engine to the Boothorpe feeder, 13 mile, is a rife of 140 feet, thence the summit-level of 44 miles extends, through the principal tunnel to its north end; thence to the Cloudhill branch, 1/2 of a mile, is a fall of 84 feet, and thence to Ticknal works is it level. The Cloudhill, Swadlingcote, and Hinckley branches, are level with the line, and the Staunton branch falls 28 feet therefrom. On this canal are two tunnels, one near Althby de-la-Zouch town of 700 yards in length, and the other near Snarlon of 200 yards. At Shackerston and at Snarlon there are aqueducts; and at Boothorpe a refervoir with a steam-engine for pumping up its water into a feeder for the summit-level of the canal. The rail-way branches, and some part of the canal were completed previously to May 1802, but it was not until about May 1805, that the whole of the line was completed and opened. The company were authorized to raise 200,000l, the amount of shares 100l. each. Public wharfs are provided on Althby wold, and at Green-hills near Sutton Cheney. Sir George Beaumont, the owner of collieries at Coal-Orton, to which rail-ways had previously been made at great expense connecting with the Leicifter navigation, is to be compensated, and the company may purchase certain annual quantities of his coal for such purpose. This company is also bound to indemnify the Leicifter navigation, and to allow them a rate of 26. 6d. per ton on all coals carried upon this canal or its branches beyond a certain point from the coal-pits in the neighbourhood of their water-levels or rail-ways. To the Coventry canal company they are also bound to pay 5d. per ton for all coals, and some few other articles, which pass upon any part of this canal or its branches, and afterwards upon any parts of the Coventry, the Oxford, or Grand Junction canals, or from either of those canals to this: and for duly enforcing this half compensation, the Coventry company are authorized to erect toll-houses and bars, and station their own collectors when and where they may chuse upon the works belonging to this company. The rates of tonnage allowed, vary from 2d. to 2½d. per ton per mile on different goods, while some articles are to be allowed to pass toll free. Our limits will not allow of stating these particulars, which will be found in Phillips's History of Inland Navigation, 4to. Appendix, p. 128. In June 1795, a survey was made by Mr. Whitworth for connecting the north end of this canal, by means of the proposed Commercial canal, with the Trent and Mersey and the Chelfer canals, and opening the long wihed for communication between London, Hull, Chelfer, Liverpool, Manchifter, &c. for river-boats of 40 tons burthen. In consequence of the failure of this scheme, in the January following, it was proposed to extend this canal to the Trent at Burton, and to the Trent and Mersey at Shobnall.

Avon River, (Bath.) The general direction of this navigation is about S. E., in length 26 or 27 miles, by a crooked course in the county of Somerset, and skirting that of Gloucester: it opens into the Severn river, and is most of it a tide-way. The objects of this navigation are as various, as the imports and exports of such large places as Bath and Bristol, and a populous neighbourhood require; besides its connection with the Kennet and Avon canal, and the other canals therewith connected. The city of Bristol is the 7th place in the order of British population, having 68,645 inhabitants, and Bath is the 12th, with 32,300 inhabitants. The commencement of this river is in the King's road in the Severn river (here about seven miles wide), and its navigation ends at Bath, near the commencement of the Kennet and Avon canal. About the year 1803, or 1804, an act was obtained by the Bristol Dock company, for converting about 70 acres of the old and crooked course of the Avon into a vast floating-dock for ships, and to cut a new channel for the river. About May 1804, these works commenced, under Mr. W. Jephson, and great progress has been made towards their completion. Two cast-iron bridges are erecting over the Avon near these works; one of them from Clifton-down to Leigh-down will, it is said, be 200 feet high above the surface of the water, and the other sufficiently high for ships to pass under it. That effcctual appendage, a towing-path, was wanting on this river, until the above company was established, who are making one on each side of the river, from Pill up to Bristol, and one thence to Hamburgh mills; from which place up to Bath, a towing-path is proposed to be extended, under an act, for which notices have just been given; this last part of the river is also intended to be improved in other respects. We have, also, lately seen a notice for a further application to parliament by the Bristol Dock company, for erecting a dam and overfall, with sluices, &c. at Red-cliff in Bedminster, to keep up the water for the new floating docks, and for other amendments of their former acts; in 1796 it was proposed that the Kennet and Avon canal should be extended to this river at Bristol. At Bitton below Bath, it was lately proposed, that the Glouceftcr-rail way should connect. In 1792, Mr. Stratford gave a design for a new stone bridge in Bristol of one arch, 150 feet span, and 32½ feet high, which Mr. John Smeaton examined and approbated; and in 1795, the last mentioned engineer gave a design and estimate for a floating dock nearly as above; after which, Mr. Campion made other designs.

Avon River, (Salisbury.) The direction of this navigable river is very nearly north, and its length near 30 miles, in the counties of Hants and Wilts. The general objects of this navigation are the supply of Salisbury, and the adjacent country, and the export of its agricultural produce. Near Salisbury, it connects with the Southampton and Salisbury canal. Salisbury contains 7,668 inhabitants, and is the 7th place in the order of our population; Fording-bridge, Ringwood, and Chrift-Church, are likewise considerable towns on the line. The commencement is at the sea in Chrift-Church harbour, and termination at Salisbury. The locks and works of this navigation had not been long completed, before a sudden flood happened, which swept away the greater part of them; in which state it lay until 1771, when Mr. James Brindley surveyed its course, and recommended a new canal by the side of the river; this was not however adopted, but the river-works have since been repaired; and the imperfection of them, was, we believe, among the most powerful motives for the adoption, in 1795, of the Southampton and Salisbury canal above mentioned. Mr. Smeaton examined Chriftchurch harbour in 1764, and recommended another pier to be built west of the old one.

Avon River, (Stratford.) The general direction of this navigation is about N. E. by a crooked course of near 40 miles in Worceftershire and Warwickshire: the lower end thereof is but a few feet higher than the tide-way. The trade thereon is very various, depending in a great measure on the connection which it forms between the Severn river and the Stratford canal. Tewksbury, Perifore, Exefham, and Stratford, are considerable towns upon it. It commences in the river Severn at Tewksbury, and terminates at Stratford on Avon, near the junction of the Stratford canal. George Perrot, esq. is the proprietor of this navigation, and entitles to certain tolls, which were not to be levied by the new communication with the Severn, which the Worcefter and Birmingham and Stratford canals were to open, but they
they were, by the act for the latter concern (13 Geo. III.), to make good any falling off in their tolls. About 1792, the Stratford and Croydon was proposed to proceed from this river at Stratford to the Oxford canal.

Avon River. The general direction of this navigation is almost S. E. from about 11 miles in length by a crooked course in the county of Somerset; it is but little elevated. Its chief objects are the import of coals and export of farm produce, Axbridge being the only town of any importance upon it. It commences in the Bristol channel near Uphill, and terminates near Axbridge. An act of the 42d Geo. III., passed, for altering and improving that part of it which is between Beydon and Axbridge. At Ilmum the Bristol and Taunton canal was once proposed to join this navigation; as the Exeter and Uphill was designed to do at Uphill.

Axmouth and Langport. In 1769, Mr. James Brinkley surveyed this line, which is nearly north, and about 30 miles in length, in Devonshire, Dorsetshire, and Somersetshire, crossing the south-western branch of the grand ridge. The objects of it seem to have been the supply of coals, exporting the products of the country, and opening a communication between the south coast and the Bristol channel, by means of the Parrett river. Axmiller, Chard, and Ilminster are the principal towns which this line was to approach; commencing in the tide-way at Axmouth, and terminating in the Parrett river at Langport.

Avon and Calder Navigation. Act 9 of 10 of Will. III. The general direction of the Avon river is nearly west, for about 40 miles by a serpentine course, from which the lowest part of the Calder river branches, nearly south-west, by a crooked course of about 15 miles, all in the Weft Riding of Yorkshire. The first of these rivers, though an interval one, begins near the level of the tide-way, and no parts of either of the navigations thereon are much elevated. The objects of this navigation were at first very considerable, in the imports and exports of the populous, manufacturing, and coal country through which it passes, and they are greatly increased, since it has formed part of the grand communications between the port of Hull, or the German Ocean, and the towns of Manchester and Liverpool, or the Irish Sea, by means of the Leeds and Liverpool, Rochdale, and Huddersfield canals, and others joining them. It connects near Saugh with a branch of the Don or Dun river; at Leeds, with some considerable rail ways extending to collieries from the coal-field; near Wakefield it connects with the Barnley canal. Leeds is the 8th place in point of population in Britain, having 51,162 persons, and Wakefield the 6th, with 81,181 persons; Hunslet, near it, is the 10th, with 57,599 persons; Snaith, Selby, and Pontefract, are also considerable places near this navigation, which begins in the Osfer river near Armyn (to which place 50 and 60 tons ships come up), and terminates its north-western branch at Leeds in the Leeds and Liverpool canal, and its south-western branch at Wakefield in the Calder and Huddersfield navigation. It has also a branch of canal about 7 1/2 miles to the Osfer river at Selby, for shortening the distance to York, &c.; and another of 1/3 mile near Matlock, between the Ayre and Calder rivers, for shortening the voyage between Leeds and Wakefield. The boats generally used hereon are 56 feet long, 134 wide, and draw 3 feet water, with 28 tons laden; the 53 boats often go down the Hunter, and round the course of the Welland and Great Ouse river. The proprietors are authorized to exact a high rate of tonnage as 16d. per too in winter, and 15d. in summer, between Leeds and the Osfer. It is provided in the Huddersfield act, 34 Geo. III., that if any communication is hereafter made with that canal to the cayford, the proprietors of this are to be compensated. The opposition of these parties proved fatal, in 1769, to a canal which Mr. Gridley surveyed between Selby and Leeds.

Barnsley Canal. Act 9; of Geo. III. The first part of the course of this canal is south, and the remainder well, about 15 miles in length, in the West Riding of Yorkshire: its western end is considerably elevated above the level of the sea. The principal objects of it seem to be the export of coals and potato-fines, and forming a short communication with Rotherham and Sheffield (by the Dearne and Dod canal, with which it commences at Eyming wood near Barnsley), and Leeds. Wakefield, Halifax, Manchester, Liverpool, &c. Wakefield is the 6th town in the order of population, with 81,311 persons; Barnsley is also a considerable town. This canal commences in the lower part of the Calder river, or Ayre and Calder navigation, a little below Wakefield town, makes a turn when it arrives at the Dearne canal, and terminates at Barnby-bridge near Cawthorn; there is a branch of 2 1/2 miles to Haigh-bridge in Wooley parish, and railway branches to Barnsley town 1 mile, and to Silkhole 1 1/2 mile. From the Calder to the junction of the Dearne and Dod canal, about 9 miles, is a rise of 129 feet; this is effected by three locks together, near Agbridge, having a low level or side-cut brought up to near the upper pound, with a steam-engine for pumping up the water again, which is let down by the lockage; by 13 other locks near Watton, and a long side-cut, from which engines pump up the water to supply the pound above these; and, near Bargy-bridge, by 4 other locks, a side-cut, and engine. On the Haigh-bridge branch there are also 7 locks together, with a low side-cut, and a steam-engine for pumping up the water required for lockage. At Eyin is an aqueduct-bridge. This canal is adapted to the ufe of the same sized boats as navigate the Calder. It is provided, that any railway or turn-roads, that may be made northward from Bargy-bridge (or mill) shall be discontinued or removed, if a cut shall be made from the Calder and Huddersfield navigation, to connect therewith: also, that the steam-engine near Warmfield shall be so contrived as to burn its own smoke, to prevent any nuisance to the inhabitants. The company were authorized to raise 57,000l. shares, 100l. each. This canal was completed and opened 8th of June 1799. The rates of tonnage on different articles are various: some fixed at 6d. to 4d. for the whole length of the canal; and various others at 3d. to 5d. per ton per mile, with several exemptions, rates of wharfage, &c. See Board's History, 410. App. p. 40 to 43. The engineers were Mr. William Jefferys, Mr. William Wright, and Mr. Gell.

Barrow River (Ireland). This is one of the rivers, for the improvement of whose navigation the Irish parliament granted several sums of the public money, between the years 1753 and 1771, amounting to 13,000l. It is probable that less than the half of this amount, raised and expended by individual proprietors, with that circulation which fell interest can alone inspire, would have effected what we are told, this expenditure has left very imperfect. At Portarlington and at Monesteren this river was to be joined by different branches of the Grand Canal.

Basingstoke Canal. This line of canal was first proposed in 1772, as an extension of, or appendage to, the canal between the immediate vicinity of the River Thames, between Reading and Maidenhead; but it was many years before the first act for this was obtained, in 1778; the other act is the 33 of Geo. III. The general direction of this canal is nearly west, by another a crooked course of 37 miles in length, in the counties of Surrey and Hants; the summit-pout thereof of 22 miles in length is upon a high level, near the south-east branch of the grand-ridge on its north side. The principal objects thereof seem the import of
of coals, and export of timber and agricultural produce, from
and to the Thames. Basingstoke and Oldham are considerable
towns on or near its line, which commences in the Wey
river at Welley, (about two miles from its junction with the
Thames,) and terminates at Basingstoke. A cut of 6 miles in
length, and with the summit-pound, was proposed
northward to Turgis Green, but has not yet been begun, as
we understand. The first 15 miles from the Wey river has a
rise of 195 feet by 29 locks to Dabbrook, (the part at each
lock being about 7 feet) from whence to Basingstoke it is
level: 45 ton boats are used on this canal. At Grewel is a
tunnel, part of which interferes the chalk strata, (about 4
mile in length) that had the misfortune of falling in; but the
fame has, we are told, been subitaeniously repaired. At
Alderhot there is a large revoir for the supply of this canal,
(which was begun in 1788 and completed in 1796, at the ex-
pense to the proprietors of 160,000l.) and a feeder from the
river Loden. There are 72 bridges over the canal, and several
culverts across, to convey the water from the upper to the
lower lands. The company were authorized to raise 185,000l.
The price of freight from Basingstoke to Hamborough wharf,
London, for coarse and heavy goods, was, in 1800, 15l.
per ton; to the dockyards, as far as Deptford, 16s. and
to Blackwall docks, 17s. per ton for timber, &c. The
length of a passage is three or four days. In the year 1796
there was an intention of extending a branch from near
Grewell tunnel, of about 22 miles in length, to the naviga-
tion that connects with Southampton water; about 1794
there was an expectation of its being joined by the canal
which will next be mentioned; and in 1801, notices were
given of an intended cut from Chilton-n Moor to Baghot-
green in Windleham; for want of these or other fome other
junctions that shall throw a greater trade into this canal, has,
though improving, been as yet rather unproductive to the
share-holders. In 1800 there was a proposal for extending
the Grand Surrey to meet this canal at the Wey river.
Basingstoke and Hampstead. About the year 1793, a line
of canal was projected, and notices given, extending from the
Basingstoke canal at that town, to the Kennet, and Avon
canal at Hampstead, 2 miles above Newbury, the length of the
line was laid to be 22 miles; we have since heard no-	hing of this scheme.
Belfast to Loch Neagh. This line of canal was be-
gun under an act of the Irish parliament several years ago,
for forming a communication with the sea at Carrick-furgus
Bay and the above inland lake or loch, as also, for export-
ing marble from the quarries thereof near its line.
Belper Canal. In September 1801, notices were given
for a proposed canal, rail-ways, &c. from the Cromford
canal at Bull-bridge, to Black-brook-bridge, through the
parishes of Crick, Heage, Ashley, Hay, Belper, and Duff-
field; all in Derbyshire.
Bingley-and Hertford. Several years ago a proposal
was made, for joining the lea river at Bingley-with the
Lea river at Hertford, by means of a canal passing the town
of Hitchin, by which an internal communication between
Lynn and London would be opened; but the difficulty of
supplying a summit-level near Stevenage with water, teems
a greater obstacle than the expected trade would pay for
surfounding.
Birmingham (old) Canal. Acts the 8th, 9th, 11th,
23d, 24th, and 34th of Geo. III. the last but one of which
acts, unites the concerns of this company with those of the
Birmingham and Fazeley canal below; but as these canals
were constructed and remain under distinct provisions in the
acts, and take different directions from the town of Bir-
mingham, where they meet, we have deviated from our
usual rule and continued them separate in our account. The
general direction of this canal is about S. E. and 32^1
miles in length by a crooked course, through the counties
of Stafford, a detached part of Salop and Warwick: it
forsage near the grand-ridge on its eastern side, at a
high a level as to cross it near its northern end without any
deep cutting or tunnel; and, in that high situation is wholly
supplied by revoirs for fower waters, and steam engines
which pump up the water again, after it has been let down
for lockage, or out of old and difused coal-pits. The prin-
cipal objects of this canal are the carrying away of the coals
from the numerous mines on its banks and branches, and the
manufactured goods of Birmingham to Liverpool, Man-
chester, &c. It connects near Farmer's bridge at Birming-
ham, with the Worcester and Birmingham, at Tipton Green
with the Dudley canal, and near Wolverhampton with the
Wyrley and Essington canal. The great towns on and near
the same are, Birmingham, the 6th in the order of popula-
tion, containing 735,606 inhabitants: Wolverhampton, the
33d, with 12,565 persons; Walfal, the 47th, with 10,390
persons; Dudley, the 97th, with 10,177 persons; and Bil-
don, the 87th, with 6,914 persons: in the centre of so large
and active a population as this, the wonder in a great mea-
sure ceases, that this canal, constructed and carried on under
such peculiar disadvantages, should nevertheless have proved
the most lucrative concern of the kind in the kingdom.
This canal commences in the Staffordshire and Worcesterfield
canal at Aldersley or Authority, near Wolverhampton, and
terminates in the Birmingham and Fazeley canal, at Farmer's
bridge, near the upper end of the town of Birmingham, the
line being double in two places, viz. at Tipton, where a
tunnel of near 1000 yards, and a canal of 11/4 mile in length,
between Bromfield and Deepfield has been made since
1794, for avoiding a zig-zag loop round Tipton hill, of 4
miles; also at the Smithwick locks, where two canals with 3
locks on each have been made, since 1757, for accommodating
the immense traffic which is hourly passing. The collateral
cuts are very numerous, the principal one extends from near
Bromwich to the town of Walfal, by a crooked course of
64 miles; from this branch nine or more branches strike off
to as many coal-works, &c. on each side of it; the termi-
nation of some of these, near Wednesbury town, at
Bowlfad's Broad-water engine, Toll-end, Bradley, Bilston's
Ram-farm, and other coal-works: the lengths of all which
are several miles. From the line there is also a cut of about
one mile, to Oker-hill coal works; another to Meffis.
Bolton and Watt's famous Soho foundery, and another to
Newhall-ring bafon and wharf in Birmingham. In the first
mile and three quarters, the rise from the Stafford and Wor-
cester canal is 151 feet, by means of 20 locks, then 184
miles are level; a descent of 18 feet then takes place, by 3
locks (on each of the two branches before-mentioned); the
remainder of the line about 43 miles is level, to the junc-
tions of the Birmingham and Fazeley and the Worcester and
Birmingham canals at Farmer's bridge. The Walfal branch,
where it leaves the line, has a fall of 18 feet by means of
3 locks, and about two miles further near Rider's green,
a further fall of 48 feet by 6 locks, whence to Walfal is level;
the Toll-end branch has a rise of 15 feet by 3 locks, and
the Bradley of 20 feet by 4 locks, all the other cuts being
level. This canal was originally cut 28 feet wide at top, 16
at bottom, and 43 deep; but by constant wear and widen-
ing it is now 40 feet wide at the top on the average. The
locks are 70 feet long and 7 wide in the clear, and the boats
carry about 22 tons. At the coal-works near Farmer's bridge,
and at its side cuts, 40 boats can unload at the same time;
the Newhall-bafon of 2 acres, is for the unloading and loading
of timber, stone, slates, and general merchandise, no wharf-
age is charged at either of these wharfs. Originally, there
was
was a summit-level on the line of about one mile in length at Smithwick, 18 feet higher than a precedent, (of which 1000 yards were deep-cutting 48 feet in the deepest part) and it was supplied until 1787, by a steam-engine at each end; and, when, owing to the increasing trade, this summit was cut down, and 6 locks removed, making the deep-cutting one mile in length, and 46 feet deep in one place; and though this work was 2½ years in hand, and cost £5,000, yet it was so managed, that the passage of boats was only 14 days interrupted thereby. There is a considerable reservoir near Oldbury, and another near Smithwick, with feeders for conveying their waters into the summit level. The celebrated Mr. James Brindley was the original engineer, and on the 6th of November 1769, he completed 10 miles of the line and branches next Birmingham, by which coals were first brought by water to that great town from near Wednesbury, and their price to the inhabitants was lowered at once from 1½s. and 1½s. to 7½d. per ton! In October 1772, the line was opened, and in June 1799, the Walsall branch was completed. The proprietors were authorized to raise £115,000 before the consolidation of this and the Birmingham and Fazeley concerns. At first the shares of these were 100l. each; but were by the second act 9th Geo. III. reduced in number and made 100l. shares; those created since the 24th Geo. III. are 170l. shares. The original tonnage on all goods, (excepting lime-flour) was 1½s. per ton per mile, and for lime-flour and lime, 3½d. per ton, except for manufacturing the lands of the adjoining proprietors, and road materials were allowed towards toll-free; but the subsequent alterations in the several acts since would much exceed our limits to mention, those who are curious of further information will find it in Mr. John Cary's Island Navigation, 4to, pages 36 to 45. By the Dudley act, 25th Geo. III. this company are entitled to certain tolls on goods passing on or off of that canal to this; and, by the Wyre and Eflington act (32 Geo. III.) to other rates for the junction therewith; all which may be seen as above. About the year 1790, a cut was proposed from this canal (instead of the Dudley junction) to Netherton colliers 12½ miles, by a tunnel through the grand-ridge near Oldberry, of 2,078 yards, and 184 feet under the hill: in 1796, a foundery and large works belonging to Meffrs. Bolton and Watt, were erected on the banks of this canal 5 miles from Soho. This canal extending across a country full of coal, it was apprehended that the fining of the old pits might damage the same, and the company have power to enter and examine mines to prevent their working within 12 yards of the canal, except by passages of 4 feet wide, and 6 feet high; for want of more strict attention to this, some of the branches near Wednesbury have been undermined and broke into, so as to caufe the canal to be abandoned in that part. From some of the old worn out coal-mines shafts near Billitone, a lambent blue flame arose in the night, of which a great deal has been said and written. Probably from the carbon in these yards of this canal, or its branches, may make coal wells thereupon.

BIRMINGHAM AND FAZELEY CANAL. Acts 23d, 24th, 25th and 34th of Geo. III.; the second of these acts is for confolidating this concern with the old Birmingham above; but each part of the canal remains subject to its own original regulations, as above observed, and the last but one is for confolidating ¼ of miles of the Coventry canal herewith, subjéct to the original powers of the Coventry act (8th Geo. III.) under which it was first out and made. The general direction of this canal is S.W. exclusive of the late Coventry part, which lies in a direction between N. and N.W. from the original termination at Fazeley: the length of the whole is 204 miles in the counties of Stafford and Warwick: the whole of this line of canal is considerably elevated, but particularly the S.W. end in the town of Birmingham, which is situated near the grand-bridge on its eastern side. The great objects of this canal are, the export of the manufactures of Birmingham towards London or Hull, and of coal; the supply of grain and other articles to Birmingham and its populous and busy neighbourhood; it connects with the Wyrely and Eflington canal near its commencement at Whittington-bridge, with the Coventry at Fazeley, with the Wharf and Birmingham at Dibeth, and with the Warwick and Birmingham canal near its termination at Farmer's bridge. Birmingham, as before observed, is the 6th British town, with 73,670 inhabitants, and Tamworth near the line, is a considerable place. The commencement of this canal is in the detached part of the Coventry canal, at Whittington-bridge, and its termination in the old Birmingham canal at Farmer's-bridge at the top of Birmingham town. From the N.E. entrance of the town of Birmingham, a branch skirts the town to the lower part of it called Digbeth, and there connects with the Warwick and Birmingham canal. From the detached part of Coventry canal at Whittington-bridge, to its junction with the line of that canal at Fazeley, and thence palls the small aqueduct bridges near Middleton-hall, about 8½ miles are level with the Coventry canal; from thence to the aqueduct bridge over the Tame river at Salford, 10¾ miles, has a rise of 50 feet by 14 locks, thence to the Digbeth branch, near 12½ miles, has a rise of about 71 feet by 11 locks; thence to the old Birmingham canal at Farmer's bridge, about 12½ miles, is a rise of about 85 feet by 13 locks; the Digbeth cut, of about 11 mile in length, has a fall of 40 feet, by 6 locks to the Warwick and Birmingham canal. The width of this canal is about 30 feet, and its depth 2½ feet. The locks are 70 feet long and 7 wide in the clear, carrying boats with about 22 tons of lading. There are a wharf and baston at Dibeth for the accommodation of the lower part of Birmingham. The Salford aqueduct bridge has 7 arches over the Tame river of 18 feet span each. The Digbeth cut is tunnelled or rather arched over in the town of Birmingham; there is also a short tunnel on the line where the Liverpool road croffes. The Coventry company being unable for want of money to proceed with the essential part of their line, between Fazeley and Fradley, where it joins the Trent and Mersey canal, the latter company for the sum of 500l. over and above the actual expences, undertook to complete this length, by agreements of the 29th October 1783, which the act (of 23d of Geo. III. above) confirmed; this they accomplished, the half year after Fradley in January 1787, which the Coventry company in Oct. 1787, purchased of them, agreeable to the 23d Geo. III. (which occasions them now to have a detached length of canal); the other half, between Whittington-bridge and Fazeley, was completed in October 1789, and on payment of the colt thereof by this company, it was conveyed and made over to them, agreeable to the act above quoted. On the 12th of July, 1792, the aqueduct bridge at Salford being completed, as well as the line of canal, the same was opened, and the water communication between Birmingham and Hull or London, was thereby effected. The sums of money to be raised for this canal, were not distinguished in the acts from what was intended for the extension and improvement of the old Birmingham canal, the amount of each share was £170; but the act 24th Geo. III. limited the number of shares to 500, they feem now to be variable. The rates of tonnage are too complicate for us to attempt their particulars, and we must refer the readers to J. Cary's Inland Navigation, pages 40 to 44, and pages 75 and 77. By the Warwick and Birmingham act (32d Geo. III.) certain duties are secured to this on goods passing from or to that canal, which may be seen in Cary, page 44. It is provided that
that the tonnage per mile on coals, is to be the same on this and the Coventry and Oxford canals.

Bishophportford and Cambridge. In the year 1785 Mr. John Phillips, in a quarto treatise, recommended a line of canal from the Stort river, at Bishophportford, to the Cam, at Cambridge, either by way of Littlebury and the Granta river, or near to Royston by the upper part of the Cam; which might be done, he says, for little more than 20,000l. but no levels, or other essential particulars are given; nor do we hear of any such, when Mr. R. Dodd again revived this idea in 1851, and wished to make this line part of his North London canal.

Bishophportford to Wilton. In 1780 Mr. John Ronnie was employed by several gentlemen of Elles to survey and report on a line of canal from Hifs, near Wilton, on the Brandon or Little Ouse river, at the edge of the fens in Suffolk, to the Stort river at Bishophportford; the distance from the little Ouse to Ugley, the beginning of a proposed tunnel (of 2 of a mile) near Eppingham, 43 3/4 miles, with a rise of 25 1/4 feet; thence to Fuller's-end, near Eppingham, 24 miles, and level; and thence to the Stort at Bishophportford, 44 1/4 miles with 83 feet fall; a cut was proposed to Darwell on a branch of the Cam river, and it was to cross the Lark river. Several large reservoirs were designed, and three tunnels, two of them being necessary to reach the town of Saffron-Walden, and to make Audley park. The estimate was 175,000l. and a bill was brought into parliament, in 1790, for the same, but it there met a fatal opposition.

Blackwater Navigation (Ireland). This river falls into Loch Neagh, and for extending a navigation therefrom to the Dungannon and Tyrone collieries, the Irish parliament, between 1753 and 1770, granted various sums of the public money, amounting to 11,000l.; a canal with 8 locks, terminating in a basin, was constructed before Mr. Davis Du-kart the engineer was employed thereon; who, finding the three miles with 200 feet rise, which remained to do to reach the Tyrone collieries, to be too great for a canal with locks, he contrived, about 1776, four water-levels, with three inclined-planes, of 70, 60, and 50 feet rise; to connect them, on which small boats were made to ascend and descend, as we have already mentioned, these being the first inclined-planes for boats brought into use in the United Kingdom; it appears, however, that these were soon laid aside in this place, and a railway was substituted. This navigation was intended to connect with the Newry canal.

Blyth River. This river, between Northumberland and a detached part of the county of Durham, appears to be navigable but a small distance above Blyth harbour; but we understand it has several considerable railways connecting with it, for bringing down the produce of the collieries to the shipping.

Boyne River (Ireland). This is one of the rivers on the east coast of Ireland, for which the parliament, between 1768 and 1771, granted 9,507l. for improving its navigation. At Edenderry it was proposed to be joined by a cut from the Grand Canal.

Bradford Canal. Acts 11 and 42 Geo. III. The general direction of this short navigation is south nearly, and 3 miles in length, in the Welf Riding of Yorkshire. It is not considerably elevated; its objects are the export of coals, iron, and flone, the produce of the neighbourhood of Bradford, and the supply of Bradford town, which is the 95th in the series, with 6,593 inhabitants. It commences in the Leeds and Liverpool canal at Wibsey, in Idle parish, and continues to Bradford, where railways of considerable extent connect with it, one of them goes to the collieries and iron-works on Wibsey Slack; and the descent is so steep that the waggons run down without horses, having their velocity regulated by a man who rides behind and uses the convey or brake upon the wheels, as occasion requires. From the Leeds and Liverpool canal to Bradford is a rise of 51 feet by 7 blocks; the width of the canal at top is 24 to 32 feet; and its depth is 5 feet; the locks are of the same width and length as those of the Leeds and Liverpool canal. The company were empowered to raise 600l. in 100l. shares. Boats passing the whole or any part of the distance on this canal are to pay 6d. per ton for clay, bricks, stone, coals, lime, dung, and manure; and 1d. for every ton of iron, timber, and all other goods. This canal was finished in 1774. The last act was found necessary, in order to make good the title to those lands which had been long before purchased for the works.

Brecon and Abergavenny Canal. Acts 33 and 44 of Geo. III. The general direction of this canal is about N.W. 33 miles in length, in the counties of Monmouth and Brecknock in South Wales; it begins a few miles from the coal, and soon after comes near and follows the course of the Usk river, no part of it being very greatly elevated. Its objects are the exportation of coals, iron, and other mineral products of the country round Abergavenny, by means of the Monnowshire canal, and the supply of Pontypool, Abergavenny, Crickhowel, and Brecon towns, that are near its course. It commences in the Monnowshire canal, 1 mile from Pontypool, and terminates at the town of Brecon; it has several railway branches: viz. to Abergavenny 1 mile; to Wain-Dew collieries and iron-works 44 miles (near 24 miles of this last being double on each side of the brook); and, to Llangroin 14 mile. From the Monnowshire canal, the first 14 miles are level, 7 miles above the Abergavenny branch, thence to Brecon is 18 1/4 miles, with a rise of 68 feet. Near its commencement it crosses the little river Avon, on an aqueduct, and shortly after passes a tunnel of 220 yards in length. The engineer is Mr. T. Dastford jun. - The Wain-Dew rail-ways, and the canal above them, up to Brecon, appeared to be finished in June 1822, and by this time we expect the whole is completed, or nearly so. The company were at first authorized to raise 150,000l. and a further sum by their second act, shares 100l. each. The rates of tonnage are to be the same as those on the Monnowshire canal, which fee in J. Phillips's History, 450. App. p. 18. Horses, mules, and asses are to pay 1d. and cows, sheep, and cattle 1d. each at certain toll-gates on the rail-ways. The Monnowshire canal, on account of the great benefit this will confer on it in tonnage, agreed to pay this company in March 1794, the sum of 35,000l. In May last (1802) it was proposed to extend a railway branch from this canal to connect with the river Wye.

Brecon Railway. About the year 1793 it was in contemplation to make a railway and canal from the famous lime-works at Brecon to the Trent river, opposite to Welton Cliff; and in consequence, a clause is inserted in the Derby canal act, of 33 Geo. III. binding them to make a cut from the Trent at Welton Cliff to the Trent and Mersey canal, which runs parallel with the Trent, whenever this scheme shall be adopted, in order to give this lime a readyer course into Derbyshire.

Bridgewater's Canal. Acts 32 and 33 of Geo. III., the 2d, 6th, (Trent and Mersey act) and 35th of Geo. III. The general direction of the principal line of this canal is nearly N.E. (and not a great way from its eastern end, a main branch goes off in a N.W. direction nearly); the length is 40 miles, in the counties of Chelten and Lancaster. It begins in the tide-way; above which the whole of it is elevated 24 feet at low-water, except about 600 yards, which the locks occupy
CANAL.

occupy to gain this ascent. The great objects which induced the late excellent and patriotic duke of Bridgewater to undertake and to expend a princely fortune on the completion of this canal were, the supply of the town of Manchester with coals from his collieries near Worsley; the cheaper and more expedient conveyance of goods, between Manchester and Liverpool, than the Mersey and Irwell river navigation then furnished; and between both of these places and the interior and most remote parts of the country, by means of the Trent and Mersey (which it joins at Preston Brook), and its connecting canals. Other and more direct communications have since been made between it and the interior and eastern parts of the kingdom, by means of the Rochdale canal and those connecting therewith. Manchester is the 3d place in Great Britain for population, having 144,000 inhabitants. Liverpool the 4th with 77,057 inhabitants, and Warrington the 45th with 10,567 inhabitants, these towns being near this canal. The commencement of this canal is in the vicinity of the Mersey river at Runcorn-gap, and one of its terminations in the Rochdale canal at Castle Field in the town of Manchester, the other (or Worsley branch) is at Pennington near the town of Leigh, the junction of these branches being at Longford bridge; near Manchester there is a communication with the Mersey and Irwell navigation, and Manchester Bolton and Burley canal, by means of Medlock brook. Under the town of Manchester are arched branches of the canal of considerable length, from one of which coals are hauled up by a coal-gin, through a shaft out of the boats below, into a large coal-yard or store-house in the main street, at which place the duke and his successors, are by the first act bound to supply the inhabitants of Manchester at all times with coals at only 4d. per cwt. of 140lb.; a circumstance which must have had a great effect on the growing population of this immense town within the last 40 years. At Worsley is a short cut to Worsley mills, and another to the entrance banon of the famous under-ground works or tunnels, of 18 miles or more in length in different branches and levels, for the navigation of coal-boats; some of which are as much as 60 yards below the canal, and others 33½ yards above the canal; these last, to which the boats ascend by means of an inclined-plane, that we have already described, extend to the veins of coal that are working at a great depth under Walsden Moor. Most of these tunnels are hewn out of the solid rock; from the lower one, the coals in boxes are hauled up out of the boats, as they are in Manchester town mentioned above, and the whole of the lower works are prevented from filling with water, by large pumps worked by the hydraulic machine, which we have already mentioned in this article, and the water is thereby always kept at the proper height for navigation on the lower canal. Near Worsley, a branch of about 15 mile in length, proceeds on to Chat-Moss and there ends, across which celebrated morasses, it was by the first act intended to proceed, to the Mersey and Irwell navigation at Hollin Ferry near Glazebrook; but, like the cut proposed by the side of the Mersey to Stockport (7½ miles with a rife of 60 feet) was never executed, and the necessity for them is now in a great measure done away, by other plans which have been carried into effect. The rife of 82 feet in the first 600 yards from the Mersey, by 10 locks, is the only deviation from one level on this canal (except in the Worsley coal-mines above mentioned); and this length of level-water is further increased; by 18 miles on the Trent and Mersey canal which connects therewith, making in all 70 miles of level. The width of the canal at top is 52 feet on the average, and depth 5 feet; the boats that navigate between Worsley mines and Manchester are only 4½ feet wide, the others are 50 ton boats or upwards; there are also numerous boats for passengers; large warehouses have been built for goods, at the Castle Field in Manchester adjoining the canal.

Besides the tunnels under Manchester and at Worsley mines, we have been through a short one in passing a gentleman's house and a church, we think at Groppenhall. On this canal are three principal aqueduct bridges over the Irwell at Barton, where it is navigable, and over the Mersey and Bollin rivers, besides several smaller ones, and many road-aqueducts. There are also several large embankments, one over Stockport meadows, is 500 yards long, 17 feet high, and 112 feet wide at the base; that at Barton bridge is 200 yards long, and 40 feet high; at Bollington is also a tremendous embankment. The principal feeders for this canal are Worsley brook, and the mine-water there collected, the Medlock brook at Manchester, and the lockage of the Trent and Mersey canal; and water, which never was scarce in this canal, now is abundant, since the increase of supply by the lockage of the Rochdale canal.

Mr. James Brindley, the engineer, owed much of his well earned fame to the happy contrivance and complete execution which he displayed in every part of this great concern; since the decease of Mr. Brindley, Mr. Gilbert and Mr. Benjamin Sobben his Grace's agents, have done themselves great credit, by the mannerly manner in which they have conducted the canal concerns of their noble employer, and improved and extended his works, as Mr. Thomas Bury has also in the mining department, so intimately connected therewith. The tunnelling at Worsley, and the canal between that and Manchester, were begun immediately on the passing of the first act; on the 17th of July, 1761, the Barton aqueduct was completed, and coals were soon after conveyed thereby to Manchester. On the 31st of December, 1772, the 10 locks at Runcorn were opened; in August, 1774, two packet-boats began to proceed regularly part of the way between Manchester and Liverpool, and on the 21st of March, 1776, the whole of the works which were then intended were finished; the extension to Leigh has been made since 1795. The illustrious duke of Bridgewater, justly filed the father of British Inland Navigation, died greatly lamented in March 1803, and left this immense concern, (which cost at first 229,000l. it was said, and probably in the whole twice that sum, as the tunneling at Worsley alone has been estimated at 108,000l.,) to earl Gower, the present proprietor, whose second son is to inherit it; the net proceeds are paid now to be from 50 to 80,000l. annually. The tonnage has not been increased since the first act, although the length of the canal has been increased to nearly four times what was at that time intended; boats may navigate the whole course or any part on paying 2s. 6d. per ton. Vessels passing out of the Trent and Mersey at Preston-Brook and into the Mersey at Runcorn, or the reverse, pay 1d. per ton for that distance; and all vessels passing to or from the Rochdale canal to this canal at Manchester are to pay, for passing through 4d. per ton, and for all other articles 14d. per ton. It is provided, that flour shall not pay any tonnage on this canal, if the wheat whereof it was made had already paid. Irrigation, or watering of meadows, is practiced in a very judicious and profitable manner, by water let out of this canal at Worsley and other places. The price of land-carriage for goods between Manchester and Liverpool was, on the passing of the Duke's third act, 40s. per ton, and by the navigation on the Mersey and Irwell 128s. per ton, but his Grace limited his price to 6s. per ton: yet, such has been the increasing trade of these two places, that it was in 1794 seriously
seriously maintained, and made the ground of another proposed navigable communication, by a junction of the Manchester Bolton and Bury, and the Leeds and Liverpool canals, that both the Duke's canal and the river navigation were inadequate to carry the trade between Manchester and Liverpool, and that the most frequent and ruinous delays were experienced by the merchants. In 1802, we find the idea again revived of a cut from the Leeds and Liverpool canal to the Leigh branch of this canal. About 1772, the Liverpool and Runcorn was proposed as an extension of this canal from Manchester; in 1799, the Manchester Bolton and Bury, was proposed to be joined directly with this canal, by means of aqueducts over the Irwell and Medlock at Manchester.

Bristol and Gloucester. In the year 1797, we were told, that surveys were making of the line for a proposed canal from the Bath Avon at Bristol to the Severn at Gloucester, and also, of a continuation of the same across the Stratford Avon to the Severn at Worcester.

Bristol and Taunton. Several years ago, a canal was proposed, we are told, from the Avon river at Bristol to the town of Taunton, with cuts to Nailsea collieries, to the Axe river at Brean, and to the town of Langport, but we are not further acquainted with its objects or particulars.

Brothric River. This is a small river on the coast of Angers county in Scotland, and navigable, we believe, but a small distance up from the harbour of Aberbrothick at its mouth, which harbour is of great antiquity, and appears to have had piers and works erected for its improvement and security, for long back as the year 1194; the spring tides here rise 15 feet.

Bude and Hatherleigh canal. In 1793, the Earl of Stanhope proposed a line of water-levels and railway-ways, between the sea in Bude Haven, on the Brigliton-Channel part of the Cornish coast, and the neighbourhood of Hatherleigh in Devonshire, paffing the town of Holdsworthy, for carrying up sea-fand, (which in this bay consists of a congeries of broken shells), as a manure, and exporting of farming produce; the rise on this line was upwards of 500 feet, up whose lordship proposed, that his 2 ton boats should be conveyed at proper intervals on inclined-planes, whose peculiarities have been already mentioned in this article. In April last (1805), we find a scheme on foot, for improving the harbour of Bude and building a pier for the protection of ships.

Bude and Launceston, or the Tamar canal. This is one of the few inlinces, in which an act (14th of Geo. III.) was obtained, without any part of the scheme having been carried into effect. Mr. Edmund Leach the projector of this, in his Tractate on Inland Navigation, proposed, that it should proceed from the tide-way in Bude Haven, Cornwall, on the Brigliton Channel, and proceed near to Launceston, and into the tide way of the river Tamar near Callistock, in the S.E. part of Cornwall. There was a provision, that the powers of the act were to cease in 10 years, if the canal was not proceeded with; it was proposed, to purchase only 39 feet wide of land, and not to be allowed to cut more than 39 inches deep into the earth on the lower side, in any part, except for docks, &c.; the canal to be 21 feet wide at top and 12 at bottom, with a towing-path on each side of it, 10 ton boats to be used; the direct distance of the two extreme points is only 38 miles, but owing to the extremely serpentine course of the level which was to be followed, its proposed length was 81 miles, and was estimated to cost 1000l. per mile. Locks were not to be used, but inclined-planes for boats of Mr. Leach's contrivance, of which we have already given an account in this article. From the sea at Bude, was to be a plane of 54 feet rife, thence a level of 69 miles, then a plane of 130 feet rife, then 4 miles of level, and a third plane of 60 feet rife to the summit-level, which extended 34 miles to Launcheon town, and 34 miles beyond; then, a plane with a defect of 120 feet, then 2½ miles of level, and a fifth plane, at Kelly Rock, of 120 feet fall to the Tamar navigation. A cut or feeder of 3 miles was proposed, from the Tamar to Llanell to St. Tankins on the Pack-faddle (being a low point on the south-western branch of the grand-ridge). Mr. Leach, however, tells us, that these levels are not to be entirely depended on, and mentions 25½ feet as the elevation of the Pack-faddle. The principal objects of this canal were the carrying of salt and flinty sand from the coast into the interior of the country as manure (an object since in part accomplished by the Tamar manure, and the Severn canals). In 1785, Mr. Leach wished to revive this project, and to shorten the course to 45 miles, by cutting down the summit 18 feet, and making a tunnel of 100 yards; and to form another communication with the sea at Wemmouth-bay, where the same broken shells abound; the cost was now estimated at 53,100l.

BurrEstowness Canal. The act of the 8th of Geo. III. (for the Forth and Clyde canal) established a set of proprietors for this canal; its direction being nearly west for about seven miles in the counties of Linlithgow and Stirling, in Scotland; from the tide-way in the harbour of Borrowtowns, on the Firth of Forth, to the Forth and Clyde canal, near its eastern terminus at Grangemouth. Its objects are flated to be, the avoiding part of a dangerous and difficult navigation on the Forth, and for improving the lands of Kinnel and Beercrofts, through which it passes. Borrowtowns, Linlithgow and Falkirk are considerable towns near this line. The depth to be seven feet, and width and size of the locks at the entrance proportionable thereto, the canal being level. The company are authorized to raise 8,000l. for each. The shares to be 50l. each. The tonnage of lime, lime-fine, and iron-fine 3d. per ton per mile, all other goods and articles (except road-materials and manures) 1d. per ton per mile.

Burry River. This river, or estuary, connecting with the Brigliton Channel, is between the counties of Caermarthens and Glamorgan, in South Wales, and is navigable a distance of ten or eleven miles to Llwythor or Longllyr, in nearly an east direction; at the flats in Llanell it is joined by the Caermarthenshire rail-way, and another railway has lately been laid from this river to the Penclawd copper-works: in 1801, the Llannerry and Llanelly canal was proposed to join at the Spitty in Llanell; and, in October 1805, a wet dock was proposed to be made on the east side of the Llanell pier, to communicate with the Caermarthenshire rail-way.

Caerdyse. This is an artificial channel or ditch, as ancient as the time of the Romans in this country, from the Neva river, a little below Peterborough, to the Wibun river, three miles below Lincoln, of near 40 miles in length; it appears to have been very deep, though now almost grown up; and it is rather doubtful whether it ever was intended or used for the purposes of navigation.

Caermarthenshire Railway. Act 42 Geo. III. The general direction of this line of railway is nearly north for 14 or 15 miles in Caermarthenshire; it commences on the coast, and is not very greatly elevated in any part; its general objects are the export of coals, iron, lead, &c. from the country through which it passes. Llandilow Vawr is the only considerable town near its course. It commences in the Burry river, at the new basin for ships; at the flats near Llanell, and terminates at Caeiil y-Garry line-works in Llanhafangel Aberbythick. In the deep cuttings for this
this rail-way near Munydd Mawr several unknown veins of good flint-coal were discovered, and some of lead ore; in November 1804, the embankment near this place, consisting of more than 40,000 cubic yards of earth was completed, with the rail-way upon it. In October 1805, it was proposed to make a wet-dock for ships at the commencement of this line, on the east side of Llandyli pier; in 1801, the Llandowery and Llanelly canal was proposed to pass through nearly this line of country.

Caistor Canal. Acts Geo. III.—The direction of this line is east 9 miles in the county of Lincoln; it is but little elevated above the sea. Its objects seem the importation of fuel and other articles, for the supply of Caistor town, and the export of farming produce: it commences in the Aneholme navigation, at South Kelby, and terminates at the town of Caistor. The company were empowered to raise 25,000l., shares 100l. The rates of tonnage are from 2d. to 8d. per ton per mile on different goods, with other rates for corn, &c. See Phillips’s 4th Hist. p. 47. All flues for the use of government, or materials for roads, to pass free at all times, and manures for the adjoining lands, when the waters run over the lock-weirs. In 1804, there was a proposal for extending this canal from Caistor, along the foot of the Wolds, thence, to Hambleton Hill, in Tealby, near Market-Raisin, the expense of which was estimated at 6,500l.

Calder and Huddersfield Navigation. Acts Geo. III.—The general direction of this navigation is nearly west, about 23 miles in length, in the well riding of Yorkshire; it has a considerable elevation above the sea at its west end: the general objects are the communication between Liverpool, Manchester, and Hull, by means of the Rochdale and Huddersfield canals, and Ayre and Calder rivers, the import and export of goods from Halifax, and the export of paving-stone (now so much used in London, called Yorkshire paving) from the famous quarries at Ealand-Edge and Cromwell-Bottom, and lime from Houghton, Brotherton, and Fairburn: at Cooper’s Bridge it is joined by Sir John Ramsden’s canal (leading to the Huddersfield canal), and at Dewsbury by the Dewsbury and Birstall rail-way. Halifax is the 58th British town, with a population of 8,886 perfs; Wakefield the 64th, with 8,151 inhabitants; and Huddersfield the 81st, with 7,678 persons. This navigation begins in the Ayre and Calder navigation on the latter river, at Wakefield, and terminates in the Rochdale canal, at Sowerby-Bridge. There is a rail-way branch of about half a mile to Bradley colliers; it has a cut of about half a mile in length by the side of the Hebble river, to Salter-Hebble; and provision is made (in 33 Geo. III. for Barfley) for a cut to Barg-hill, on a branch of Barfley canal; there are several locks; one of them near Salter-Hebble, of 10 or 12 feet rife, was in 1783, removed, and two new ones, of half that height, with a bason between them, were substituted by Mr. William Topp; some of the locks here erected in 1761, by Mr. Smeaton, have single gates at their heads. At Salter-Hebble are a bason and large warehouses, and others at Sowerby Bridge, for the accommodation of the town of Halifax; near Ealand is a large weir across the Calder river. This navigation was planned or superintended by Mr. James Brindley, and afterwards by Mr. John Smeaton. About 1765, the navigation was brought up to Ealand quarries, and about 1776, to Salter-Hebble, and to Sowerby-Bridge warehouses. The stone and white flate from Ealand-Edge are carried in carts and four-wheeled carriages, to be put on board of the keels at Bridghofe wharf, on account of the great height of the quarries above the Calder; the Cromwell bottom-flume is put on board at a wharf there. From the

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quarries of Thomas Thornhill, Esq. at Lillton’s Wood, near Ealand, a long and wide maintain plate, of about 45° of elevation, was, about the year 1774, made from the Calder river, and paved with large flat flumes, on which a barge deflected loaded with stone, and by means of a rope passing over a wheel and axle, drew another empty flume up the plate; this continued in use for some years; but this flume was finished before the year 1783. In 1761, a violent flood happened on the Calder river, which destroyed many of the works therein; the Mr. Smeaton repaired, and in 1774 another happened, so destructive that the navigation was for near a year suspended, before they were repaired; the fall of this river is no less than 3 feet per mile for more than 20 miles together. By the act 34 Geo. III. for Huddersfield canal, this navigation was guaranteed against a diminution of its tolls, by any other communication to the eaitward opened therewith. In 1794, the Manchester Bolton and Bury canal was proposed to be extended to join this at Sowerby-Bridge. In 1803, the Wibsey and Dewsbury railway was proposed to join at Raven’s Bridge, and notices have in the present autumn (1805) been given for the Wakefield and Eller rail-way, intended to join this navigation at Bottom-Boat near Wakefield: a side-cut is now making near Bridge-houfe, for avoiding the mill-dams, and improving this navigation.

Can River. The general direction of this navigation is about south-well, for 14 or 15 miles in the county of Cambridge; it is but little elevated above the level of the sea; its principal object is the supply of the town of Cambridge, which is the 59th in the order of our population, with 10,087 inhabitants: Ely also, near this navigation, is a considerable place. It commences in the great Ouse river, at Harrimere, and terminates in the town of Cambridge. It has a cut or reach of 3 miles to Reche, and another of 3/4 miles to Burwell, at which last place the Bishopsgarford and Wilton canal was, in 1780, proposed to join. The Can river is embanked above the adjoining fields through all its lower parts, is without locks in some parts, and has sluices for making sluices of water, to enable boats to pass the shallows and hard.

Can River. The general direction of this navigation is about south-east for near 8 miles, in the county of Cornwall; it is within the flow of the tide, and is chiefly used in the import of coals and export of agricultural produce; it communicates at Guineaport, near Wobegby, with the Pelbrock canal. Padlow, on its banks, is a considerable town; it commences in the Irish channel, at Stepper Point, and terminates at Waterhead.

Canterbury and Newborl-Bay. In the year 1802, a canal was proposed, and again in 1803, and surveys taken, for a canal on a level, capable of carrying sea-built vessels, between the sea at St. Nicholas Bay, near Margate, to the city of Canterbury, about 10 or 11 miles in a south-west direction, there to connect with the Stour river, and with a canal then proposed, called the Medway and Rochester canal. Canterbury has 9,000 inhabitants, and is the 57th place in the order.

Cardiff and Merthyr-Tydyl Ral-way. Acts about 35 Geo. III.—This line is nearly in a north-west direction, for 24 miles, in the county of Glamorgan, in South Wales. The general object of this railway is the export of iron from the great works at Merthyr Tydyl, Dowlais, &c. Cardiff, Caeplhill, and Merthyr are considerable towns on or near this line, which commences at the floating-dock, in the Severn at Lower Layer, the termination of the Glamorgan canal, by the side of which, very nearly, it proceeds to Merthyr Tydyl, and thence the lime-works at Penton, in Merthyr parish; at Quaker’s yard a branch of

C. C. 9.5 miles.
6 miles goes off to Caron mill, in Bedwellty; Howfrey, Hill and Co. are the proprietors of this part of the tram-road, and it was, we believe, constructed under the first act of parliament ever passed for this kind of roads; the width of land allowed to be purchased was 7 yards. On the 21st Feb. 1804, a trial was made of one of Trevithick's high-pressure steam-engines for driving trains on this tram-road, as before mentioned, and 12 tons of iron and 70 persons were drawn for 5 miles by the power of steam, without the use of conducting-water. At Merthyr there is a curious and suspended water-wheel, of 50 feet diameter, made of cast-iron.

CARON RIVER. The direction of this river is well, in the county of Shropshire, in Scotland, and for 3 miles it is navigable, from the Ercall river to Caron bridge, for vessels drawing 5 or 8 feet water at high-tides; at Caron there is a cut from the River and Gyle canal; and near Caron bridge are the famous Caron iron-works.

BART RIVER. The direction of this navigation is nearly south, for about 3 miles in Kentchurch, in Scotland; its objects being the supply, and the export and imports of the great manufacturing town of Peterley, which is the 15th in the order of British towns, and contains 31,779 persons. Renfrew is also a considerable town near the fame; this navigation commences in the Clyde river, near Inchinnan, and terminates at the town of Paisley, at which place it was proposed, in 1803, to be joined by the Glasgow and Saltwater canal.

CHELMEER and BLACKWATER NAVIGATION. Acts 6 and 33 Geo. III.—The general direction of this navigation is nearly east for 134 miles in the county of Elfs; its general objects are the supply of Chelmsford and its neighbourhood with coals, deals, &c. and the export of farm produce. It commences in the Tide-way, at Collier's Reach, in the estuary of Blackwater river, and proceeds by the course of the Chelmer river to the basin at Chelmsford town, with a cut near 4 of a mile to Malden. Chelmsford and Malden are considerable towns. From low-water in the basins at Collier's reach to Heybridge-mill, on Blackwater river, 14 miles, is a rise of 12 feet 6 inches, thence to Bedly or Bally-mill, on Chelmer river, 15 miles, is a rise of 7 feet 6 inches; thence to the basin at Chelmsford is 105 miles, with a rise of 5 feet 6 inches; the branch has a rise 6 feet 8 inches in the basin at Malden. Mr. John Sweaton surveyed this line in 1762, and recommended 13 miles of new canal, and estimated the sum at near 160,000l.; Mr. John Reeves was afterwards employed. The basin at Collier's reach was opened for ships in February 1790; the company were authorized to raise 60,000l. of the shares 100l. each; in 1802 these were so depreciated, that they were paid not to be worth 5l. each. The spring-tides flow 5 feet at Bally-mill- mill, and 8 feet at Malden bridge; the neap tides do not raise the water above one foot at the last place.

CHELTENHAM and Tewksbury. In 1801, notices were given for a proposed canal from the Severn river, near the junction of the Avon therewith, at the town of Tewksbury, to the town of Cheltenham, through the parishes of Tewksbury, Tredington, Elingham-Hardwick, Uckington, Swindon, and Cheltenham, a course nearly south-east for about 8 miles, in the county of Gloucester. Tewksbury and Cheltenham are considerable places.

CHESTERFIELD CANAL. Acts 11 and 17 Geo. III.—The general direction of this canal is about south-south-east for 18 miles, in the county of Chester; it is not greatly elevated above the level of the sea; its principal objects are the export of farming produce, and the import of coals and lime for Nantwich town, and the surrounding country; it forms a double communication between two points in the line of the Ellesmere canal, at Cheltenham and at Frankton common. Cheltenham is the 25th British town, with a population of 15,072 persons. Nantwich is also a considerable town. This canal commences in the tide-way in the Derwent river, in the town of Chester, near to where the Ellesmere canal crosses the same, and terminates at the town of Nantwich; at Stoke, in the parish of Acton, it is joined by the Whitchurch branch of the Ellesmere canal; from Cheltenham to Barbridge, near Tiverton, the distance is 143 miles, with a rise of 170 feet 10 inches, and thence to Nantwich it is 82 miles, and level. The canal passes Cheltenham, Tiverton, Whitchurch, Nantwich, and Chester, and terminates at Manchester; at Workop, near Tiverton, 9 miles, the level of Dee proposed, the communication burthen Renfrew/hue, in Scotland; there is a tunnel made at the level of Dee; and a branch is made to join the Loddon canal, near Tiverton, 9 miles. This branch was intended to form a connection between the Derwent and the Tiverton, and to join the Trent and Mersey canal, but not into it. Although this branch, intended for bringing salt to Cheltenham, was not executed, the expenses amounted to 60,000l. and the shares became perhaps the most depreciated of any concern in the kingdom, being held at one time, as we are informed, for one per cent. of their original value. In 1793, a junction was proposed near Nantwich, with a branch of the intended Sandbach canal; in 1793, a rival scheme to the Ellesmere, called the Eastern Grand Trunk, was proposed to join at Crow's nest; and in June 1796 the Commercial canal was proposed to join at the same place, in order to form by means of the Aledy-de-la-Zoumb canal, and others, a communication for 40 ton boats, between Liverpool, Cheltenham, Hull, London, &c.

CHESTERFIELD CANAL. Acts 10 Geo. III.—The general direction of this canal is nearly south-west, by a crooked course 46 miles in length, in the counties of Nottingham, York, and Derby; the western end is considerably elevated; its principal objects are the export of coals from near Chesterfield, and lead from the Derbyshire mines, and the import of lime, corn, timber, &c. Chesterfield, Workop, and Retford are considerable towns upon this line, which commences in the Trent river, near its junction with the Idle river, at Stockwith, and terminates at Chesterfield town; from the Trent to Workop the distance is 94 miles, with a rise of 253 feet; thence to Norwood it is 9 miles, with a rise of 85 feet; and thence to Chesterfield it is 23 miles, with a fall of 45 feet; the number of locks is 65; the lower part of the canal, from the Trent to Retford, is for large boats of 50 or 60 tons burthen; above this the width is 26 to 28 feet, and depth of water from 4 to 5 feet; the boats here used being 70 feet long and 7 wide, and carrying 70 to 22 tons each. In 1794 such boats as those of 500l. new, 500 to 1000l. each. The boat-owners here usually pay their bargemen by the ton of goods which they convey rated distances, instead of weekly wages. At Norwood is a tunnel through Hartwell of 3050 yards in length, being 12 feet high and 9 feet wide, in the forest of Gresford, and 30 feet below the surface of the hill; this tunnel was begun in November 1774, and finished the 9th May 1775; at Drake's-hole is another tunnel of 1533 yards in length. Mr. James Brindley projected this canal, and directed its execution until his death in September 1772, when his brother-in-law, Mr. Heyshott, succeeded, and completed the whole in 1776. The tonnage is 12d. per ton per mile, and in calculating the same 4th of a mile is taken into account, and 4th of a ton. It appears that the canal cost 163,000l. and the shares were at first much depreciated, and sold for a long time.
time below par: in September last (1825) the profits amounted to 61 per cent. annually. In Mr. Bridley’s time, a junction was intended at Chelford with the proposed Chelford and Swarkestone canal; and in 1822, an extension of this canal was proposed of 5 or 6 miles in length, nearly south to Alloa.

**Chelford and Swarkestone.** The late Mr. Bridley, about the year 1771, proposed a canal from the Trent and Mersey canal at Swarkestone to the Chelford and at the latter place, the direct distance being about 25 miles nearly north, the line being through a country very rich in coals. Derby, the 45th town, with 10,623 inhabitants, was to be in the line of this canal, and the town of Belper is also near it.

**Cheister Haven.** This inlet of the sea, on the coast of Hampshire, is of considerableness, in different branches, navigable for ships, surrounding Thorny Isle, and connecting with Langstone and Portsmouth harbours. Havant and Chichester are considerable towns near it. In September 1805, notices were given for cutting a short canal, to commence with a sea lock in deep water in this haven, and proceed to Upper Southgate field, in Chichester, there to terminate in a spacious basin or dock.

**Clithy River.** This river has nearly a north-east course, in the county of Pembroke, in South Wales. It commences in the tide-way in Milford Haven, and terminates at Cannister bridge, near Narberth, which is a considerable town; and Pembroke on another branch of the haven is also a considerable place.

**Clay River.** Acts 34 Geo. II. and 9 and 11 of Geo. III.—This river or frith commences with a bold noble and capacious estuary, in the northern or Irish channel, and extends nearly north, to Groonoo, when its direction changes towards the east, and its width diminishes gradually to Glasgow, where the navigation terminates. Glasgow is the 5th town in Britain, in point of population, containing 77,385 inhabitants: Paisley, in the vicinity of this river, is the 15th town, with 31,179 persons; Greenock, the 20th, with 17,749 persons; and Ruthay, (on the Isle of Bute) the 118th, with 5,487 persons: Ruthven, Glenfinn, Dumbarton, Port-Glasgow, Irvine, and Ayr, are also considerable places on or near the banks of this river. At Glasgow below a branch of the grand Forth and Clyde canal joins this, as also the Monkland canal, and Edinburgh and Glasgow canal; near Luchman the Fort canal joins, and at Dalhousie the Forth foot; the western termination of the Forth and Clyde is in this river; while the navigable locks and founds which connect therewith below Dumbarton are both numerous and important; by means of locks, Fine, and Gilp, there is a connection with the Crinan canal. In the year 1805 an act (45 Geo. III.) was obtained by the earl of Egbyton and others, for building new piers and improving Arrofdin harbour, and building wet-docks, &c., near Saltcoats, on this river, and in this harbour, as also at Glasgow, the Glasgov and Saltcoats canal was, in 1823, proposed to connect therewith; at Ruthay, on the Isle of Bute, piers have been built, and the harbour connecting with this river improved; Greenock harbour is also under great improvement, in conformity of an act of 45 Geo. III. The trade on this river is very immense and various; it appears that Greenock alone employed 175,551 tons of shipping therein in the year 1820.

**Cononock Brook.** Act 7, Geo. III.—The direction of this navigation is nearly north for about 6 miles, in the north riding of Yorkshire, commencing in the Swale river near Topcliffe, and extending to the town of Thirsk, for whose accommodation it is intended.

**Conon River.** The general direction of this navigation is nearly N.W. for about 8 miles, in the county of Westmorland; its objects are the import of coal, deals, &c., and the export of produce, and of all the produce of the banks below Wivenhoe. Colchester is the 45th place in Britain, with a population of 11,730 persons. It commences with an avenue at Mersea Island, and terminates at the town of Colchester, to which place small sail-built vessels can get up. Larger ships navigate to Wivenhoe, where there is a dockyard for building frigates and large trading vessels.

**St. Columb Canal.** The general direction of this canal is nearly N. for seven or eight miles, in the county of Cornwall; although near the coast, it is considerableness. Its objects are the export of a particular species of stone found about St. Dennis, called China-dune, naked in great quantities in Wedgodwood’s, and other patterns near the line of the Trent and Mersey canal, and the import of coal, and of a sea-fand confidant of broken blocks for manure. This canal was proposed to proceed across the western branch of the grand ridge to the south coast; not one third of which length has, however, been carried into effect. St. Columb Major, St. AUSTELL, and Grampton, are towns near the line. It commences at the sea-shore of the Irish channel near St. Columb Minor, and terminates at present within about two miles of St. Columb Major; from thence it went to Pons St. Dennis, St. Stephen, St. Ewe, and arrive at the sea again near Pentewan, not far from the famous Polgarrath mines and engines. The part which was completed about the year 1775, commenced on the top of a very high cliff, and pursuied the course above mentioned, without locks, we believe. The canal was a narrow one, and at its west end, the cliff was with great labour hewn down, into a steep inclined plane, that was covered with planks: the canal was conducted to the very top of this plane, and the boats which were rectangular ones, were brought, when loaded with stone, to the termination of the canal, where they were hauled by a fort of hinges; strong ropes were then attached to the stem of the boat, and by means of a wheel and drum, worked by a horse-gin or wench; the boat was hauled up an end, and the stones were thereby shot out, and rolled down the plane to the landing below, from whence boats conveyed them on board the ships. The frame wheel and drum was adapted for drawing boxes of coal or Shelly sand up the plane, in order to their being loaded into the returning boats. Near to its eastern termination the canal was conveyed over by an aqueduct bridge over a road. We have been favoured with these particulars by a Cornish gentleman, from whose account of inclined planes was written, or we should have noticed this (the plane on Pons St. Dennis canal and another on the Calder and Helles) as early instances of the use of inclined planes for boxes of goods, &c. For seven or eight years this canal continued in use, but whether like the Moraweg canal, in its neighbourhood, it has since been disused, we are not at the present moment able to learn.

**Commercial Canal.** In the year 1766, Mr. R. Port Whitemarsh was employed to survey this line, proceeding from the Chelfer canal at Nantwich to the Abbé de la-Tonich canal near that town; it was proposed to join Sir Nigel Griggy’s canal and the Newkyle under-kin canal, to cross the Trent and Mersey canal near Burton, and proceeding by Uttoxeter, to cross the Trent and Mersey canal again, and the Trent river at Burton. The objects of this proposed canal were, the forming of a communication for larger boats (40 tons) than the Trent and Mersey is calculated for, except below Burton, and contributing towards the wished-for passage of large boats between Liverpool, Manchester, Chelser, Hull, London, &c.

**Conway River.** This river has nearly a south course for
14 or 15 miles, betwixt the counties of Caernarvon and Denbigh in North Wales; its principal object seems to be the supply of Llanrwll and Aberconwy, which are considerable towns. It commences at the tide-way in Conway bay, and terminates at Llanrwll town. In June 1802, it was in contemplation to straighten the course of this river, about a mile below Llanrwll, by a new cut 502 feet long, 88 feet broad at top, and 50 at bottom, with a dam at its upper end across the old crooked channel. At Llanrwll, there is a curious stone bridge of three arches, built by Inigo Jones, over this river; and in 1802, it was proposed to construct a temporary cast iron bridge over it at Aberconway ferry, in order to facilitate the communication with Ireland by way of Holyhead, in the Isle of Anglesey; another iron bridge being intended at Bagor ferry, on Menai strait.

COOMBE-HILL CANAL. Act 32 Geo. III. — The course of this canal is nearly S. E. for 34 miles, in the county of Gloucester: its general objects are the export of coals from the mines near it, and shortening of the length of land carriage to Cheltenham, which is a considerable town; and so to Tewkesbury near its western end. It commences in the Severn river at Fletcher's leap in D.arrnville, and terminates at Combe hill in the parish of Leigh, the river being 15 feet only. This canal was constructed at the sole expense of three persons, viz. Thomas Burgess, William Miller, and Sarah Almford.

Coventry Canal. Acts 8, 25, (for Trent and Mersey) and 26 of Geo. III. — The general direction of this canal is nearly S. E. for about 22 miles (exclusive of the detached part beyond the Birmingham and Fazely canal, and the branch to Coventry) in Staffordshire and Warwickshire. Its situation is high, particularly the eastern part, which crosses the grand ridge near Bedworth, without a tunnel, and its Seefwood branch does the same. Its general objects are the line of communication between London, Birmingham, Manchelter, Liverpool, &c. the export of coals from the numerous mines near it, and the supply of Coventry city, which is the 24th on the list of British population, with 10,044 inhabitants. Nuneaton, Atherstone, and Tamworth, are also considerable towns near the line; and Hinckley, the 120th, with 5,070 inhabitants, is also in its vicinity. It commences in the Birmingham and Fazely canal at Fazely, and terminates in the Oxford canal at Longford; its detached part of 54 miles in length, commences at the termination of the Birmingham and Fazely canal at Whittington brook, and terminates in the Trent and Mersey canal at Bradley heath; near to Whittington brook, it connects with the Wyreley and Elwington canal, and at Marston bridge the line is joined by the Atherstone canal. There is a cut of about one mile in length to Griff coilleries, belonging to Mr. Roger Newdigate; another to several collieries by different branches near Seefwood-pool and Bedworth, five or six miles in length; there is also a cut of half-a-mile from the line to Bedworth; the branch to Coventry is 42 miles in length, and there is a railway-branch to Oldbury coal works. The detached part is level with the Trent and Mersey canal, which level continues (through 54 miles of the Birmingham and Fazely) to the commencement of the line of this canal at Fazely; from thence to Atherstone, a distance of about 10 miles, the ride is 56 feet, by means of 13 locks; from thence to the Oxford canal, about 12 miles, is level; so is the cut to Coventry, and thence to Griff, Seefwood-pool, Bedworth, &c. The left or highest level of this canal forms, with part of the Oxford and Atherstone, the longest level that is to be found in Britain, being upwards of 82 miles, we believe, including side branches. This is a narrow canal, but the company have bound themselves to widen the same to the width of the Grand Junction, if the proprietors of that canal shall at any future time require it. A stop-gate is maintained at the end of the Oxford canal at Longford, to prevent this canal, which is sometimes low in Summer, from drawing off their water. Mr. James Brindley was the original engineer to this concern, and 164 miles of the level part from Coventry to Atherstone was completed in 1786, when the works were suspended for near 10 years; at length, the Trent and Mersey company undertook to complete 11 miles of this original line north of Fazely; half of which they afterwards sold to the Birmingham and Fazely company; and the other half, on the 4th of February, 1787, was purchased by this company, who thus came to have a detached part of their canal. The line of communication was opened by the completion of this canal in June 1790. This company have been authorised to raise 120,000l., their shares being 100l. each. Some years after the completion of this and the Oxford canal, the shares hereon had obtained the great price of 400l., but owing to the rivalry of the Warwick and Nene canal, they were, in 1802, reduced to 350l., and their dividend to 8l. per cent. Since the completion of the Grand Junction, this concern has been flourishing, and the dividends are now 10l. per annum per share. The tonnage allowed on this canal is 4d. per ton per mile for line and lime-stone, and 14d. per ton per mile for all other articles, (except road or paving materials and manures used upon the ponds, or when the water runs to waste at the locks.) On the completion of the adjoining canals, the tonnage on coals was, by their general consent, reduced to 1d. per ton per mile upon several of them. It was agreed, between this and the Oxford company, (9 Geo. III. Oxford) that the latter should be entitled to all tolls, except on coals, that are collected on the first 34 miles of this canal towards Coventry, for goods passing from the Oxford canal, and that this company should in return receive the tolls upon coals collected on the first 2 miles of that canal. The Acts of 34 Geo. III. for Atherstone canal, granted to this company 50l. per ton upon all goods (except farming produce, manures, or road materials, or iron or its ore, made or dug on the banks of the Atherstone canal) navigated thereon, which shall, either before or after, pass on any part of this canal, or the Oxford or Grand Junction; and a further sum per ton, equal to the tonnage hereon between Griff and Longford, on all goods which may pass any new communication that may hereafter be opened between the Atherstone and the Oxford or Grand Junction; for encaening which, this company is empowered to erect toll-houses and toll-bars, and place collectors on any part of the Atherstone canal.

CRAY RIVER. The course of this river is nearly north, for 9 or 10 miles of a crooked course, between the counties of Wigton and Kirkcudbright in Scotland; its object is the supply of the adjoining country, and of Wigton, which is a considerable town. It commences in the tide-way in Wigton bay in the Irin or Northern Channel, and terminates at Newton Douglas.

Chinam Canal. Acts 33, 39, and 43 of Geo. III. — The course of this very wide and deep canal is nearly west for about nine miles, in the county of Argyll in Scotland; its sole object is the shortening of the passage for ships betwixt
between the Irish Sea and the Clyde river (by means of the loch of Fyne), by avoiding the voyage round the peninsula of Kintyre. It commences at Loch Gilp, and terminates in lock Crinn. The rise is 51 feet, and the fall 50 feet, a rivulet near the point of division serving as its feeder. The water in this canal is 12 to 15 feet deep. This line of canal was first surveyed for smaller vessels by Mr. Watt, after which Mr. John Rennie was employed herein; it appears to have been opened some time, but farther improvements, and the building of a pier in Loch Gilp are yet in hand. The proprietors have been authorized to raise 180,000l., and they have also received 50,000l. of the public money, which parliament granted in aid of this great and important work. The shares are 50l. each. A vessel under full sail, not being stopped in proper time, before the arrived at a lock on this canal, bore the same away, and went down therewith into the next pound. A passage may, it is said, be made by means of this canal in three or four days, which frequently took up three weeks. In 1802 the shares herein were 22l. below par.

Cromford Canal. Act Geo. III.—The general direction of this canal is about N.W. for 18 miles, in the counties of Nottingham and Derby; it is considerably elevated; its general objects are the export of coals and of lead, iron, lime-stone, and other minerals from the mines of Derbyshire. Wirksworth and Belper are considerable towns near its course. It commences in the Erewash canal at Langley bridge (not far from the junction of Nottingham canal therewith), and terminates in the town of Cromford near Matlock. There is a cut to Tintock coal works of three miles in length, another to Swanwick coal works; also a railway-branches to Crich lime-works, 14 miles, and to Biggarlee coal works 1£ mile. From the Firebrace canal to near Ceducton castle, four miles, there is a rise of 80 feet, thence to Cromford, 14 miles, it is level; the Tintock branch is level, and proceeds from the upper level. The width of this canal at top is 26 feet; the boats are 80 feet long, 7¼ feet wide, and 3½ feet deep; when empty they draw 8 or 9 inches of water, and when loaded with 22 tons, they draw about 2½ feet. Near Ripley is a tunnel of 3906 yards in length, which 180 feet wide within the canal's surface, and 8 feet high from thence to the crown of the arch, which is of brick, except some parts where the rock proved hard and found enough to stand without walling: the sides, walls and crown of this arch seem to be part of an elliptisp, but where as inverted or bottom arch was wanted, the same is much flatter. For constructing this tunnel, 33 pits or tunnel-flats were sunk, some of them on the summit of the hill, being 57 yards deep. This tunnel is laid to have coil 7½ per yard in length; it intersects a valuable team of coals, which is now worked, and in filling the tunnel-pits excellent iron ore was found, which is now worked, and the furnaces are supplied with coals drawn up through a shaft from below far that purpose. There are several smaller tunnels upon the line for shortening its course. Near Butterby hall there is a considerable deep-cutting, and shorter ones in other places, to avoid the loops round the points of the hills. Over the Derwent river, near Wigwell, there is a large aqueduct bridge 200 yards long and 30 feet high, the river arch is 80 feet span. Two smaller arches by its side serve to carry off floods, and for a road. Over a small river, which comes into the Derwent near Frithley, is another large aqueduct bridge about 200 yards long and 50 feet high; besides the river arch, there are two others, one for floods, and another conveys the turnpike road under the canal; these two aqueducts are laid to have coil about 6600l. There are considerable embankments in some places on this canal. Nearly over the Ripley tunnel there is a feeder of 30 acres of water when full, the head or embankment of which is 700 yards long, 3½ feet in height in the middle of the valley, the base being there 52 yards wide, the top of the bank is 100 yards wide. This feeder is laid to have coil 660l., the mean depth of it is 15 feet, and it will contain about 285,000 cubic yards full of water, which is let out by a large pipe and cock in one of the tunnel-pits. There are two other feeders for this canal, one of 16, the other of 15 acres. At the Cromford end of the canal there is a considerable stream of water taken in as a feeder, and the whole of the 14 miles of level and branches thereto have their banks made up more than one foot higher than usual to act as a sewer for dry weather. Mr. William Jelf was the engineer to this canal, and it was completed before the year 1793. The total canal is laid to have exceeded 80,000l. For the cutting and wheeling of clay, 35d. per cubic yard, per mileage of 25 yards, was usually paid; for gravel 4½d. per yard; for flinty ground 6½d. per yard, and 4d. per cubic yard extra for all done picked out and flailed. In the year 1797, a cut was proposed from the summit-level to the new collieries in Cudham park. In 1821, notices were given for the intended Belper canal, that was proposed to join this near to Biggins bridge; and in 1822, a cut was proposed to be made from the Derwent aqueduct on this canal to near Delphick, and thence near the Derwent and Wye rivers to the town of Bakewell.

Crouch River. The course of this river is nearly west, in the county of Essex. The principal objects of this navigation are the import of coals, deals, &c. and the export of farm produce, and of oysters from near Wallhithe. Bilerica and Rochford are the nearest considerable towns to this river. It commences in the English channel (about 10 miles from the mouth of the Thames), and terminates at Hull bridge.

Croydon Canal. Act 41 Geo. III.—The general direction of this canal is nearly south for 9½ miles, in the counties of Kent and Surrey: it is not greatly elevated; its objects are the supply of Croydon with coals, deals, &c. and the country through which it passes with manures and other articles, and the conveyance of its produce to the London markets, and the export of fire-clay, flint, and fullers' earth. Croydon is the 18th British town, with a population of 57,443 persons. Deptford is also a considerable place. This canal commences in the Grand Surry canal near Deptford (two miles from its connection with the Thames at Rotherhithe), and terminates at the new Basin near the town of Croydon. From the Grand Surry canal (level with an ordinary high tide in the Thames) to the top of Pimlico hill, 13½ miles, is a rise of 70 feet, by 12 locks; thence for 4 mile it is level, and thence for 3 of a mile to the beginning of Forell wood, there is a rise of 79 feet, by 13 single and one double locks; from the near to Croydon, 7 miles, it is level. The locks upon this canal are 60 feet long and 9 feet wide; each lock has a grove for stop-planks at its head, but no paddle-wiers; the water is intended to run over the upper gates. This company are to have a basin for their boats to lie in at Rotherhithe, on the south-east side of the Grand Surry entrance basin, and another by the high road near Croydon town. There are seven road bridges and 30 accommodation swing-bridges. On the top and northern slope of Pimlico hill, there is a considerable deep-cutting, and others in Sydenham and on Penge common; and near Selhurst wood is a considerable embankment. On Sydenham common there is a reservoir of 10 or 15 acres supplied in wet times by a feeder out of an adjoining vale, and into which its waite or over-fall is to be when full; there is another
Another useful or Norwood common, which, with the long Summit pound on to ten acres, a field, will be sufficient; it is preferred, to supply the locks that are making. At the time the act passed for this canal, it then meant intended to six inclinable planes, and to pump the water for supplying the ponds up from the Grand Surrey canal by steam engines, that were also intended to wind the boats up the planes; and it seems singular, under these circumstances, that legislative provision was made, for a culvert or small tunnel through Ford-hill for conveying water from the summit-level of this canal on Sydenham common, and by aqueducts or pipes to supply several towns and places with water, viz. by a branch of near 3/4 of a mile to the top of Dulwich town, and from the end of the said tunnel to Knight's hill by a crooked course of three miles in length through Norwood, and along Knight's hill towards London for one mile; also an other branch of near one mile to Streatham town. Mr. John Rennie and Mr. Ralph Dodd were the engineers, and Mr. Clark is now employed as resident engineer thereon. About seven miles of the upper end of this canal is completed and in use, and the remainder is proceeding with great expedition. The company are empowered to raise 80,000l., which is not now expected to prove sufficient; the amount of shares is 100l. each. The sum of 40£, is to be paid annually to the city of London, towards improving the Thames river above London Bridge. This canal is to have its water kept always two feet above the surface of the ground on Croydon common, and some other severe and unprecedented restrictions are introduced in favour of the millers on the Wandle river, at some miles distance.

Croydon and Wandsworth. In September 1800, proposals were made for a canal from the river Thames at Wandsworth, following nearly the course of the Wandover river to Croydon in Surrey; but the same was given up shortly after, in favour of the north Surrey iron rail-way, which passes through nearly the same tract.

Cyfarthfa Canal. The general direction of this canal, or water level, is nearly N.W. for about 3 miles, in the county of Brecknock; it is on a high level, and was constructed some years ago by Mr. Bacon, to bring coals and iron ore from the mines in the mountains, to his furnaces at Cyfarthfa, near Merthyr Tydfil. The whole is upon one level, and it does not connect with any other canal or navigable river; it is now the property of Mr. Cragasfa, the great iron master. It is situated near to the northern ends of the Glamorganshire canal and the Cardiff and Merthyr railway.

Darent River. The course of this river (called Dartford creek), is south for near 3 miles in the county of Kent; it commences in the tide-way in the river Thames, and terminates near the town of Dartford, for whose supply it is principally used.

Dart River. The general direction of this river is nearly N.W. for about 10 miles, in Devonshire; the tide flows through its whole length; its principal objects seem to be the supply of Totnes with coal, and the country with shell-fish and mussels, and the export of farming produce. Dartmouth and Totnes are considerable towns; its commencement is in Start bay, and it terminates at the Mill weir, about one mile above Totnes; this river is plentifully furred with trout.

Dean Forest Rail-way. In the year 1852, it was proposed to construct a railway from the river Ure, near to the town of Beaufort, to the forest of Dean, its object being the conveyance of the immense flues of coal and iron, with which it abounds; Colfior is a considerable town near its route. In the preceding year the Severn and Wye rail-way was proposed to pass nearly the same track.

Dean River. Act 12 Geo. III.—The direction of this river is nearly S. for about 2 miles, in the county of Nottingham; it is not greatly elevated above the level of the sea; its principal object is the supply of Newark, the 9th town in the list of British population, with 6730 inhabitants. It commences in the river Trent, at Crakley's, in South Markham, and terminates at the upper weir near the town of Newark; the works hereon were completed in Jan. 1797. In 1793 the Newark and Bolsthed was proposed to join this at Newark.

Dearne and Dove Canal. Acts 33 and 40 Geo. III. —The general direction of this canal is about N.W. for 9 1/2 miles, in the Well Riding of Yorkshire, its northern end is considerably elevated; its objects are the communication between Sheffield, Wakefield, Halifax, Leeds, Manchester, Liverpool, &c. and the export of the coals and iron-ore, &c. to plentifully found on its course. Barnley and Rotherham are considerable towns on or near it, so in Doncaster, the 110th town, with 5697 inhabitants. It commences in a side cut of the Don, or Dun river, between Swinton and Mexborough, and terminates in the Barnsley canal at Eyming's wood, near Barnsley, there is a branch of 3 miles to Rockhill bridge, and another of 12 miles to Colne Ing. From the cut of the Don navigation to Knoll Brook the distance is 14 1/2 miles, with a rise of 4 1/4 feet; thence to Aldham Mill, 2 1/2 miles, is a rise of 24 feet, (the Colne Ing branch being on its highest level); thence to the Barnsley canal is 2 1/2 miles, with a rise of 30 1/2 feet; the Colne Ing branch is level; the Rockhill branch begins from the summit-level, and 1 1/2 mile to Wentworth bridge is level; thence to Rockhill bridge, 1 1/2 mile, it has a rise of 56 feet. The locks on this canal are built with excellent hewn or ashlar stones, and are calculated for boats of 50 or 60 tons burthen, the same as navigate the Dun river, and the company are required to keep a depth of water equal to 4 feet on their lock-fills, and in every part of their line; and for guarding against loss of water on the summit, a stop gate is to be erected hereon, near the termination in the Barnsley canal, and on that canal below the junction, both of which may be flung and locked when the supply of either canal fails, and it would confuse the water of the other. The aqueduct and other bridges hereon are substantially constructed of hewn stone. Tumbling-bays and gauge-weirs are to be erected for supplying several mills. There is a large reservoir near Elleslie. Proprietors of mines may make rail-ways to this canal, if within 1000 yards, or 2000 yards near Wath. Mr. John Thompson is said to have been the engineer, and it was completed in the year 1804. The company were empowered to raise 100,000l. The amount of shares 100l. each. The rates of tonnage on this canal are too various and complicated for the room we can allot to this subject; they will be found in Phillips' 340. History, p. 62 to 66; but it must be observed, that the last act (40 Geo. III.) made an increase of 50 per cent. on these tolls. Boats are to pay for 6 miles of tonnage, however short a distance they may have navigated on this canal. In May 1797, Earl Fitzwilliam proposed, at his own expense, to extend the Colne Ing branch to his Elleslie collieries, on being allowed water for the same from the Elleslie reservoir.

Deben River. The course of this river is nearly N.W. for about 10 miles, in the county of Suffolk; its objects are the importation of coal-loads, &c. and exports of farm produce; it commences at the sea near Felixstow, and terminates near Woodbridge, which is a considerable town.

Dell River (Aberdeen). This river takes its course about well for 2 miles, between Aberdeen and Mearns county in Scotland, the tide flowing through the whole navigable length; it commences in the harbour of new Aberdeen, where
where it is joined by the Aberdeenfoir canal. New Aber-
deen is the 19th town in Britain, with 17,597 inhabi-
tants, and its harbour was improved by a pier of 260 yards in length, begun under the direction of Mr. John Smout, in 1775, but was not completed in 1778, to make further improvements. In 1781, Mr. Thomas Telford was employed to design new works and improvements hereon, so that ships of 20 or 20 feet draught of water may be accommodated. There are excellent granite quarries near this river.

**DEE RIVER (Cheifer).** The general course of this river is nearly S.W. for about 32 miles, in the county of Flint, and skirts the county of Chelford: the first 9 miles are by a wide alluvial opening to the Irish channel, and from near the town of Flint thence, a new cut was made for the river up to Chelford, under the direction of Mr. Nathaniel Kindler-
by, about the year 1749; before which time the old channel was so choked with sand, that ships of 100 tons could not come within 7 or 8 miles of Chelford; the new straight cut, that was at first 8 feet deep in general, principally through marshes, soon recovered itself out, so that ships of 200 tons could come up to the town, and where the time of high-water became earlier by 2 days of an hour, then when the tide had to make its way through the old crooked and shallow channel. Chelford is the 25th town, with 17,607 inhabitants, Holywell near it, is the 31st, with 5,657 persons, and Flint is also a considerable town. On the N.W. side of Chelford the Ellesmere canal connects with this navigation and crosses it, for which goods pay 20. per ton to this company; it is also to receive from the Ellesmere company whatever its tolls may fall short of 21cl. annually. At Chelford this river is joined by the Chelfer canal.

**DEE RIVER (Kirkcudbright).** The course of this river is nearly N. for about 6 miles, in the county of Kirkcud-
bright in Scotland, being an alluvial opening to the Irish sea. Kircudbright is a considerable town thence, and where the Galloway canal connects therewith.

**DERBY CANAL.** Act 33 Geo. III. — This canal runs nearly N. for about 9 miles, in the county of Derby; it is not greatly elevated above the level of the sea. Its ob-
jects are, the supply of the town of Derby, and the export of coals and iron. Derby is the 44th British town, with a population of 10,612 persons. It commences in the Trent river at Swarkestone bridge, crosses and interchanges with the Trent and Mersey canal, and terminates at Little Eaton, near 4 miles above Derby, from which town a cut of 13 miles goes off to a place between Sandiacre and Long Eaton, and there joins the Erewash canal. There is a rail-
way branch of 31 miles, to Smitey-houses near Derby, another to Horley collieries, and another of 31 mile to Smalby mills. In enlar railway, or canal, should be hereafter made. S. of the Trent from Bredon lime-work, this company has engaged to make a cut between the Trent and Mersey canal and the Trent, at Welton chie, opposite thereto. From the Trent to the Trent and Mersey, 1 mile, is a rise of — feet; thence to Derby, 31 miles, is a rise of 12 feet; and thence to Little Eaton, 34 miles, is a rise of 17 feet; the Erewash branch has a fall of 29 feet. This canal is 44 feet wide at top, 24 feet at bottom; the 5 feet deep, except the upper level near Little Eaton, which is made 6 feet deep to retain the water of wet seasons like a reservoir; the locks are 20 feet long, and 15 feet wide inside: adjoining the town of Derby is a prodigious large weir or tumbling bay, where the canal crosses the **Derwent river**, that was navigable to this place for many years back, but the tolls thereof were expected to fall off on the completion of this canal, and it was therefore agreed, that this company should purchase the whole concern for 399L. A little W. of the river above-mentioned, the canal crosses a branch in a cast iron trough under aqueduct. This canal was finished in 1797; the company were authorized to borrow 50,000l. the value of shares being 100l. Separate rates of tonnage were fixed on different goods, between the Trent and the Trent and Mersey, between that and Derby, and on the different cuts and railway branches, which are too long for us to mount, they will be found in Phillips's 4th. History of Canals, p. 55 to 59. Malters are to pay toll-free, and parchmen or clagers of wood, to be used as supports in the several coal-mines, also road materials, except for turnpike roads; and if the Manfield turnpike-road tolls are reduced below 4 per cent. on their dues, this company is to make them up to that sum. The profits of this concern are not to exceed 8 per cent. but after 1700 is accumulated as a stock for contingencies, the tolls are to be reduced. Five thousand tons of coals annually are to pass hereon toll-free, for the supply of the poor of the town of Derby. Horses pay 10. and cattle 4l. each, for liberty of passing along such railway branch.

**DERWENT RIVER, (Derby).** The course of this river is nearly N.W. for about 9 or 10 miles, in the county of Der-
by; its principal object was the supply of Derby, previous to the making of the Derby canal, when this concern was sold to that company, as mentioned above. It commenced in the Trent river at Wilden-ferry, (where the Trent and Mersey canal commences), and terminates at the town of Derby.

**DERWENT RIVER, (New Milton).** The general course of this river is nearly N. for about 37 miles, in the Earl Riding of Yorkshire; its objects are the supply of New Milton (a considerable town) with coals, deals, &c. and the export of farm produce, chalk, &c. It is but little elevated above the sea; it commences in the Oford river at Barnby, and termin-
ates at the town of New Milton. In January 1804, it was in contemplation to make this river navigable up to Yedingham bridge.

**DERWENT RIVER, (Workington).** The course of this river is nearly E. in Cumberland. Workington, on its
banks, near the Irish sea, is the 189th British town, with 5,768 inhabitants; to the vicinity of this town there are several rail-
ways, which bring down coals from Mr. Curwen's, and other coal-mines, for exportation from this place.

**DEVON RIVER.** The general direction of this river is nearly N.E. in Clevelamannahshire in Scotland, from near Cambus quay, on the Frith of Forth (two and a half miles above Alloa) to Medlockton. Mr. John Smout was, in 1765, and again in 1768, consulted, about making this river navigable, or a canal by its side, the rive being 394 feet, in order to bring down the produce of several coal-mines near its banks, to be shipped on the Forth, wherein the spring

**DERWURBY AND BIRSTAL RAIL-WAY.** The general direction of this railway is nearly N. for about 3 miles, in the West Riding of Yorkshire, and its object is to bring down coals to the welfs in the Calder river; it commences in the Calder and Hebble navigation at Dewsbury, and termin-
ates at Stubkly coal mines in Birstal parish, which are worked by Messrs. Thomas Chelfer and Sons, who are also the sole proprietors of this iron railway, which was completed in the present month (October 1825).

**DON, (or Don) RIVER.** Act 12 Geo. III. The general direction of this river is nearly S.W. for near 110 miles in the West Riding of Yorkshire, (including what is, in some maps, called the Dutch river, near to the Ouse,) the southern end of this navigation is rather elevated. The original objects
of this navigation were principally the supply of Sheffield, and the export of the iron-wares and iron from Sheffield, Rotherham, &c. since which period, the Dearne and Dove canal, which joins at Swinton, and the Stainforth and Keadby, at Fishlake and at Hangman Hill, and the cut to the Ayre river near Smith, have opened new sources of supply, and for the export of coals, flues, iron, and manufactured goods of several kinds, which this rich track of country produces. Sheffield is the 14th British town, with 31,314 inhabitants, Doncaster is the 100th with 51,927 persons; Rotherham, Doncaster, Thorne, and Smith are also considerable towns on or near this navigation. The commencement is in the Ouse river, at Goole bridge, and it terminates at Attercliffe, within 2 miles of Sheffield, and has a cut to the Ayre, as above, and side-cuts with locks between Muxgbury and Swinton, and in other places; the tide flows above the junction of the river Went. The Stainforth and Keadby, act 33 Geo. III. has directed rates for boats passing out of this into that canal by the cut of this river. In September 1803, notices were given, for a new act for weirs and side-cuts to this river in Muxgborough, Sporborough, and other places, and a new course for the Dearne river. And, in February 1803, there was a design of extending this navigation to Sheffield by a canal from Tinsley, 4 miles, for which 30,000l. was subscribed.

DOSSET AND SOMERSET CANAL. Acts 36 and 43 Geo. III.—The general direction of this canal is nearly S. for about 40 miles in the counties of Wilt, Somerset, and Dorset: the middle part of it is on a high level, and crosses the western branch of the grand river. Its principal objects are the supply of the manufacturing towns and neighbourhood through which it palls, with coals from the mines bordering on Mendip, and the opening of an inland communication between the Bristol channel, the Severn, the Thames, and the southern coast of the island. Tosome is the 60th town in the order of population, with 8,748 inhabitants, and Bradford, the 78th, with 7,302 souls; Bruton, Wincanton, Stalbridge, and Sturminster are also considerable towns near the line. The commencement is in the Kennet and Avon canal at Widbrook near Bradford, and the termination in the Stour river near Gains-crofts in Shillingstone-Okeford; from near Frome a branch of about 9 miles proceeds to Nettlebridge collieries in Midsummer-Norton. The Nettlebridge branch was first cut, in order to supply coals to Frome and its neighbourhood; and water being scarce thereon, one of Mr. Fuggle's balance-locks was erected on a 21 feet fall at Mells near Froome, and was publicly tried on the 6th of September, and 13th of October 1800, and in June 1802, as particularly described in a previous part of this article. An aqueduct bridge was erected several years ago over the river near Froome, but it is with flow pace, we fear, that the works are proceeding towards a final completion. The company were by the first act authorized to raise 225,000l. and a further sum under the second, we believe, the amount of shares being 100l. Stones are to be erected at every half mile: pleasure-boats of 12 feet long and 5 broad may be used on the ponds, 30 yards in width are allowed, in general, for the company to purchase, and 100 yards wide for docks, wharfs, &c., springs may be taken and refervoirs formed any where within 2000 yards of this canal.

DOUGLAS RIVER (Lower Navigation.) Acts 6 Geo. I. and 10 and 23 Geo. III. (for Leeds and Liverpool). The course of this navigation is nearly fourth; for 9 miles in Lancashire it is but little elevated above the sea; its objects are the export of common and canal coals, and farm produce, and the import of lime-stone; it commences in the tide-way in the estuary of the Ribble river near Halskeith, and terminates in the Leeds and Liverpool canal at Brier's Mill. From the Ribble to Solom, about 5 miles, the river Douglas (or Afland) is navigable, and thence to Brier's Mill is a canal 4 miles, with a rife of 8 locks, the whole rife from the Ribble being 49 feet. The width of the canal is 24 to 30 feet, and depth of water 5 feet; the locks are 70 feet long, and 15 feet wide. The first act above authorized Meffrs. William Squires and Thomas Steers to make the Douglas river navigable from the Ribble to Mery-lane end, near Wigan, which they effected about the year 1727; being allowed 2s. 6d. per ton for goods, whatever distance they might be navigated thereon; by the first act for the Leeds and Liverpool canal (10 Geo. III.), their successors were authorized to make a junction with the Leeds and Liverpool canal at Newbrough by a cut of 35 miles long, parallel to this river, with a fall of 12 feet, which they completed in 1774, and the same now forms part of the Leeds and Liverpool canal, S.E. of Newbrough aqueduct bridge, in consequence of the purchase which that company made of the whole of this concern, in pursuance of their act of 23 of Geo. III.; since which, the canal from Brier's Mill to Solom above described, as part of the lower navigation, was cut and opened in 1783, and the river navigation between Solom and Wigan, 12 or 13 miles (on the upper navigation) has, we believe, been defued since the Leeds and Liverpool canal was completed by its tide to Wigan, and the communication by the lower Douglas navigation to the Ribble, above described, was opened.

DOUGLIDGE RIVER. The course of this river is nearly north in the county of Pembroke in South Wales, from the tide-way in Milford-Haven to Haverfordweft bridge, its object being the supply of that town.

DRIFFIELD CANAL. Acts 7 and 41 of Geo. III. The course of this navigation is nearly north, for about 11 miles in the East Riding of Yorkshire; it is but little elevated above the sea; its general objects are the import of coals, deals, &c. and the export of farming produce; it commences at Aike-beck mouth in the Hull river, and terminates at the town of Great Driffield; the first five miles is by the course of the Hull river to Fifth-holm elough, and the remaining 6 miles is by a canal; the course of the Hull river serves also as a branch of 1½ mile in length to Frodingham bridge. In 1764 Mr. John Neaden was consulted on this intended navigation.
In 1824 it was in contemplation to deepen the Frodingham branch, and about 2 miles of the canal up to Snakeholme lock, nearly 2 feet deeper than it was before.

Droitwich Canal. Art 8 of Geo. III. The general direction of this canal is about N.E. for 54 miles in the county of Worcestershire; it is not greatly elevated above the sea; its objects are the export of salt and the import of coals, of which 13,500 tons are annually imported, and used in the boiling of salt, except what the town of Droitwich consumes. It commences in the river Severn, at Hawford, and terminates at Chapel Bridge in the town of Droitwich; it has a rise of 90 feet by 8 locks. This canal was executed by Mr. James Brindley, and it is said to present a pattern to canal-makers by the neatness and regularity of its curves, and the stability and excellency of all its works. The proprietors were authorized to raise 33,000l. the amount of shares being 100l. The tonnage on every quarter of grain, or 6 bushels of meal, is 2d. and on every ton of salt, coals, or other matters, 1s. 6d. By the act for the Worcester and Birmingham canal (31 Geo. III.), the shares herein are guaranteed to produce 5 per cent. annually, and are to be made up by that company in case of their failing below that sum. Owing to the overflowings of the copious salt springs near Droitwich, this canal presents the curious spectacle of a salt-water canal, in the interior of the country, in which water very little.

Drumglass Canal. This is a canal in Ireland, concerning which our information extends no further, than that the parliament of that country, between the years 1768 and 1771, granted 3000l. of the public money towards carrying on the works.

Drumglass Canal. This is a canal connecting with the Drumglas collieries in Ireland, towards the works of which canal, and those collieries, the parliament of that country, between the years 1753 and 1771, granted no less than 117,741l. of the public money!

Dudley (and Owen) Canal. Acts 16, 25, 30, 33, and 36 of Geo. III. The general direction of this canal is nearly N.W. by a crooked course of 13 miles in Worcestershire, a detached part of Shropshire, and Staffordshire; it is situate very high, its two ends are on the eastern side of the grand ridge, while its middle, by means of two very long tunnels, is on the western side of the same. Dudley is the 49th British town with a population of 10,107 persons, and the busy and rich country through which this canal passes, furnishes an ample tonnage in the export of coals, iron, and lime, while its communication with the Stourbridge canal, by the Black-Delph branch, and the terminating canals, occasions a very considerable carrying trade thereon. This canal commences in the Worcester and Birmingham canal at Selly Oak, and terminates in the old Birmingham canal at Tipton Green; from near Dudley there is a branch of 2 miles to the Stourbridge canal at Black-Delph in Kingwinford, there is another branch of 1 1/4 mile to near Dudley town, and a branch from this last of 2 1/2 miles to a bridge of Dudley coal-works. From the Worcester and Birmingham canal to the Black-Delph branch, 1 1/4 miles are level, thence to near the entrance of the Dudley tunnel, about 1/2 of a mile is a rise of 31 feet by 5 locks, thence through the tunnel it is level, and from thence, in the last 1/4 of a mile, is a fall of 1 1/3 feet by 2 locks, to the old Birmingham canal: the Black-Delph branch has a fall of 8 1/2 feet by 9 locks to the Stourbridge canal; the Dudley branch has a rise of 6 1/4 feet in the first 1/2 of a mile, the remainder thereof being level, and the colliery branch level therewith. The depth of water in this canal is 7 feet; the width of the locks on the Black-Delph branch is 7 feet. To near Lapal, or Laplat, this canal passes through a tunnell 3776 yards long, at Godby hill it passes through another of 62 1/2 yards, under a collateral branch of the grand ridge, and at Dudley there is another tunnel of 3260 yards in length, on the summit-level of the canal; the arch of this last tunnel has a height of 138 feet. At Cradley-pool is a large reservoir for supplying the leakage of the Black-Delph branch. It is provided, that level cuts may be made from this canal towards any coal-mine, to the extent of 2000 yards. A stoplock is erected at the junction with the Worcester and Birmingham canal, by which either company has a power of preventing the other from drawing off their head of water. The Black-Delph branch was first executed, which was then united with the Dudley part of the canal which had been constructed by lord vinceount Dudley and Ward; these were completed and in use before the extension or main length to Selly Oak was designed. The company has been authorized to raise 229,100l. the amount of shares being 100l each originally. Owing to the different acts under which the parts of this canal were progressively undertaken, the rates of tonnage being different thereon, and to the variety of rates on different articles, we cannot attempt an account thereof in this short abstract, they will be found in Cary's Inland Navigation, p. 53 to 55, also p. 43, where certain rates are made payable to the old Birmingham company on account of the junction therewith, (but which have been hitherto varied by the 34 of Geo. III. for Birmingham canal) and at p. 70, will be found other rates, in consequence of the junction with the Worcester and Birmingham canal. In the Stafford act (33 Geo. III.) are several regulations relating to tolls on goods passing to or from this canal; and this company is bound to make up the profits of the Stourbridge canal to 12l. per share annually, but not exceeding 3l. on each share.

Dudham and Chester-le-Street. In February 1797 Mr. Robert Whitworth made a report in favour of a proposed canal from the Tyne to Chester-le-Street, and thence to Durham, it was estimated to cost 79,000l. and the probable advantage thereon to subinbers was stated to be near 29 per cent. Durham is the 74th British town, with 7,530 inhabitants; this country abounds in coals.

Eden River. The general direction of this river is nearly S.E. for about 12 or 13 miles in the county of Cumberland; its principal objects seem the export of coals, and the supply of Carlisle, which is a considerable town. It commences in the tide-way of the Solway Firth, and terminates at Carlisle Bridge. In 1705, the Newcastle and Carlisle canal was proposed to join this river at Carlisle. In 1779 a road-way from the earl of Carlisle's coal-works, near Brompton, to this river, was opened; and in 1803 another was intended from lord Lowther's coal-works at Warrall, about 11 miles distant from Carlisle.

Edinburgh and Glasgow Canal. This canal, projected about the year 1766, appears to have nearly a well direction for about 50 miles in the counties of Edinburgh, Linlithgow, and Lanark in Scotland; its objects are the export of coals and lime from Clyde-side, through which it passes, and the opening of a third communication between Edinburgh and Glasgow. Edinburgh (and Leith) being the 31 British town, with a population of 62,990 persons, and Glasgow the 31st, with 75,483 inhabitants; from the scanty materials to which we have at present access, it seems that this canal commences in the tide-way of the Forth, in the harbour of Leith, and terminates in the tide-way of the Clyde, in the town of Glasgow, and was finished in 1822; that at Glasgow it connects with the Monkland, and in 1823; the Glasgow and Saltcoats was proposed also to join it.

Edil and Skiff canal. In the year 1803 Mr. Thomas Telford was surveyed
surveyed this line of canal, being a length of 3 miles from the tide-way in Loch Eil within some miles of the west end of the Invernog and Fort-William, or Caledonian canal, to Loch Shiel, a fresh-water lake on the Highland coast of Scotland; Loch Shiel was found 77 feet higher than Loch Eil, and in order to conduct a 12 feet deep canal out of the former to the flour of the latter, it appears that deep cutting will be required, for about a mile to the depth of 47 1/2 feet, there being no water on the summit to supply a lockage up and down.

**Ellesmere Canal.** Acts 3, 2, two of the 36, 41, 42, and 44 of Geo. III. 1.; the general direction of this canal is nearly forth for 57 miles, by a crooked course through the counties of Chelfer, Flint, and Denbigh, (North Wales) and Salop; its principal summit is considerably elevated above the sea; its great object is said to be the improvement of the agriculture of the extensive and fertile tracts, through which it passes, for uniting the Mersey, Dee, and Severn rivers, and exporting coals, lime, and slate, from the coasts of the Welsh hills. Liverpool is the 4th British town, with a population of 77,653 persons, Chelfer is the 25th with 7,452 persons, Shrewbury the 30th with 14,730 persons, and Ellesmere the 41st with 5,553 persons; Wrexham, Whitchurch, and Oswestry, are also considerable towns on or near this canal or its branches. This canal commences in the Mersey river (9 miles above Liverpool) at Ellesmere-port in Netherpool, and terminates in the Severn river at Bagley bridge, very near to the termination of the Shrewsbury canal, to which it is proposed to be joined: at the N.W. part of Chelfer city, it connects with the Chelfer canal, and near the same place crosses and connects with the tide-way in the Dee river; from near Palford a branch of 4 miles is proposed to Holf; from near Gwerfel a branch of—miles to Talwerr coal-works in the parish of Mould, near the head of the Cegedog valley, where there is an opportunity of constructing a reservoir of 82 acres to supply the same (this branch to pass Frood collieries, Brummy iron-works, and Nant-y-frith lime-works); another short cut from Gresford to Allington; and a railway branch to Ruskobrook; and to the river Dee at Llandkamin; from near Pont-Cyfylty, a branch to Acrefair coal-works; from Francon common, is a branch of about 25 miles passing the town of Whitchurch, to the Chelfer canal at Stoke in Aclon parish near Nantwich; from which branch, another of about 7 miles proceeds from Pen-Mols to Press Heath; from Hordley, on the main line, a branch of near 11 miles proceeds to the line of the Montgomery canal near Llanymynech, and the Vernick river; there being from this branch another to the termination of the Montgomery canal at Portwyain lime-works near Llanbydowel; and another short one is intended to Marfa bridge near Oswestry. From the Mersey to the Dee (sometimes called the Wirral branch) the distance is 8 miles; from the Dee river to the Brunno or Talwerr branch it is 11 3/8 miles, with a rise of 380 feet; thence along the summit pound, and through the Chirk tunnel 8 1/4 miles are level; thence to the north end of the great iron-aqueduct, 3 3/4 miles, is a fall of 75 feet; thence to St. Martins moor, 1 mile, it is level; thence to the Whitchurch branch at Francon-common, 2 1/4 miles, is a fall of 13 feet; thence to the Llanymynech line at Hordley is 3/4 of a mile with 33 feet fall; thence to Ormond park, 14 1/2 miles, is level; and thence to the Severn river at Shrewbury is 2 miles with a fall of 107 feet. The Holt branch is level, the Whitchurch branch to that town, 14 miles, is level, and thence to the Chelfer canal, 11 miles, has a fall of 128 feet; the Press Heath branch is level, the Llanymynech branch, 12 miles, has a fall of 19 feet. The depth of water in this canal is 4 3/4 feet, and the canal in general is calculated for boats of 70 feet long and 7 wide; but the Wirral branch is formed for boats of 70 feet long and 14 feet wide. There is a tunnel near Chirk of 775 yards in length, and another at Winton-Lullingfield of 487 yards in length. At Pont-Cyfylty, this canal is carried over the river Dee in an immense aqueduct trough, composed of cast-iron plates, 20 feet wide, 6 feet deep, and 320 feet long; this is supported on 19 pair of conical stone pillars at 72 feet asunder, and the middle ones 125 feet in height! At Chirk is a very large stone aqueduct bridge of 10 arches, 200 yards in length and 65 feet high, over the Cering river; and over the Allen river there is also an aqueduct bridge. This canal is fed from the Dee river by the Llandinillo branch, and that river is compensated by a cut from Bala-pool, and, all springs within 2 miles of this canal may be taken for its use. Near Ruohon, one of Rowland and Co.'s balance locks was, in 1797, tried on a 12 feet fall for saving water, as before mentioned. The engineers employed on this extensive work, were Mellor, William Jeffy, Thomas Telford,—Fletcher, and Thomas Danford; the most considerable progress was first made at the northern end of the line, and in February 1796, flats laden with coals began to arrive at Chelfer from the Lancaster collieries by the Wirral branch, and soon after convenient passage-boats were established, for the regular conveyance of passengers towards Liverpool or back, at lower rates than is charged on Bridgewater's canal, according to distance. In January 1797, the navigation was continued to Belfton brook; and in the same year the southern end of the line was opened from Shrewbury to the Winton-Lullingfield tunnel. The immense aqueduct at Pont-Cyfylty was in hand in 1804, and was more than half completed before the end of that year, as was also the stone aqueduct at Chirk. The company are authorized to raise 500,000l., the amount of shares being 100l. which it seems were, in 1802, at 20l. below par. The rates of tonnage are, for coals, culm, lime-flower, lime, and salt, 13d. per ton per mile; for free-flower, timber, flake, iron-flower, lead-ore, iron, and lead, 2d., and for all other goods 3d. per ton per mile, except road materials and manures (but not lime) upon the pounds, or when the water flows wide over the lock-works. On crossing the Dee river at Chelfer, goods pay 2d. per ton to the Dee company, and their tolls are guaranteed to the amount of 20l. annually. While this canal was projecting, a rival scheme was started, called the Eastern Grand Trunk from the Severn at Shrewbury to the Chelfer canal at Crow's nest, with cuts to Vable-Cruise, to Bonham-Furnace, Holf, and other places.

**Evesham Canal.** Act 17 Geo. III. 1.; the general direction of this canal is nearly north, 114 miles along the foot of the county of Derby, near to Nottinghamshire; its northern end is considerably elevated above the level of the sea; its chief object is the export of coals from the numerous collieries on its banks, and those on the banks of the Nabuck canal which joins it at Stanton, and the Nottingham canal which joins it at Long Eaton, and the Trent canal near Sawley. It commences in the Trent river near Sawley (opposite nearly to the Longborough navigation or Soar river), and terminates in the Cromford canal at Langley Bridge, the rise being 1085 feet; there is an iron railway branch to Brinsley coal-works, on which experiment was, as before related, made about the year 1800, on the load which one horse could draw both up and down the declivity. By the act of 33 of Geo. III. for Derby canal, a reduction of the rates between the junction therewith and the Trent river was made, conditionally, that no other junction be made between this canal and Derby, but the present one near Sandiacre; and by the 34 of Geo. III. for Trent river, the annual rent of 5l. is commuted for a toll of 6d. on every laden boat which shall cross the Trent between the Soar and Trent river.
SAY river and this canal. A reservoir belonging to the Nottingham canal has a gauge-flume, which furnishes a regular and daily supply of water to this canal. The first survey for this line of canal was made in the year 1770.

**EXE RIVER. (Montrose).** This river is navigable but a short distance in the tide-way from the German Ocean to the town of Montrose, in Angus county in Scotland. Montrose is the 67th British town, with 7,374 inhabitants.

**EXE RIVER, (Whitby).** The navigable part of this river is but short, in a S.W. direction in the Fall Riding of Yorkshire; it commences at the German Ocean, and extends to Whitby bridge. In 1755 Mr. John Smout was consulted about clearing this river and the harbour of Whitby, of the sluic or refuse ore, from which alum had been manufactured, and whereby the harbour had become in time nearly choked up. Whitby is the 72nd British town, with a population of 7,183 persons; within a few years past, a pier has been built with free stone, under the direction of Mr. John Remie, for the improvement of the mouth of this harbour.

**EXE RIVER.** The course of this river is nearly N.W. for about 10 miles in the county of Devon; its principal object seems the supply of Exeter and Topsham; near Topsham it is to be joined by the Great Western canal. It commences in the English Channel at Exmouth, and terminates at the city of Exeter, which is the 21st town in Britain, with 17,508 inhabitants: from Exeter it was in 1803 proposed to continue the navigation to Crediton; and in 1769, the Exeter and Uphill canal was proposed to be made from the same place.

**Exeter and Crediton.** In the year 1800 it was proposed to make the rivers Exe and Crediton navigable, from Exeter city to the town of Crediton, about seven miles, above Exeter quay on the river Exe.

**Exeter and Uphill.** In 1769 Mr. John Brindley surveyed the country for a canal from the river Exe at Exeter, by Tiverton, Wellington, Taunton, and Glastonbury, to the British Channel near Uphill; the objects of which have been since embraced in the Great Western canal.

**Fergus Canal.** This is one of the Irish inland navigations, in 11 of which, public money was from time to time granted, although in the present state we are told it amounted to no more than 3½.

**FORTH RIVER, (or Forth).** This principal river of North Britain has its course nearly west for about 70 miles between the counties of Fife, Haddington, Edinburgh, Linlithgow, Stirling, Perth, and Clackmannon, the first 52 miles being a very wide estuary, the next 18 miles are filled of considerable width, and the last 12 miles next Stirling are remarkably crooked. An immense general trade is carried on upon this river, and for the supply of the metropolis of Scotland, assisted by the Edinburgh and Glasgow canal, that joins it at Leith, the Burrowflowens at that town, the Forth and Clyde, or great canal at Grangemouth, the Caron river near Rochkennar, and the Devon river near Cambus Quay. Edinburgh (with Leith) is the 5th British town, with 82,500 inhabitants, Dunferline is the 72d, with 9,500 persons, and North Berwick, Crail, Anluther, Dysart, Kirkaldie, Kinghorn, Dunblant, Inverkeithing, Muffelburgh, Queen's Ferry, Burrowflowens, Linlithgow, Falkirk, Cullrof, Clackmannan, Alloa, and Stirling, are also considerable towns on or near this fine river. It commences in the German Ocean, and terminates at Stirling bridge, and is navigable for ships through a great part of its course; at Cambus Quay the spring tides rise 20 feet, but below this there are tides called the Thрак Shallows, concerning the removal of which, Mr. John Smout was consulted in 1767. In 1801, the channel south of Luch Keith Isle was deepened, to enable ships to approach Leith harbor safely and readily. Leith harbor has undergone great improvements of late years, under the acts of 182, 183, and 45 of Geo. III., by the fall 25,000l. of the public money was granted for the wet-docks and other works which have been carrying on there under Mr. John Renie, since the laying of the foundations, in May 1831. Leith harbor on the north side of the Forth is also under improvement, and by the 45 of Geo. III., 2,000l. of the public money was granted towards the building of the pier there. In the year 1767, Meffrs. Watt and Murdoch surveyed the upper part of the Forth river, and proposed to extend a navigation from Stirling bridge to the face of lime quarries in Aberfoyle, on which the opinion of Mr. John Smout was also taken.

**Forth and Clyde Canal.** After 8, 13, and 22 of Geo. III. — The general direction of this great canal is nearly west for 35 miles, in the counties of Stirling, Dunbarton, and Lanark, in Scotland: it crosses a low part of the grand-ridge between the tide-ways of the east and west seas; its principal object is a communication between those important rivers, the Forth and the Clyde, and between the northern metropolis, and the great manufacturing towns of Glasgow, Paisley, &c.; near to Grangemouth the Burrowflowens canal joins it. Glasgow is the 5th British town, with a population of 77,385 persons, and Falkirk the 59th, with 8,935 inhabitants. Kirkintulloch and Dumbarton are also considerable places near the line. This canal commences at Grangemouth harbour in the Forth river, and terminates at Bowlings bay near Dalmeny Burnfoot, in the Clyde river. There is a cut of 24 miles to the town of Glasgow, where it joins the Clyde river, the Monkland canal, and the Edinburgh and Glasgow canal; and it was in 1803, proposed to join the Glasgow and Saltcoats canal; there is another cut with a lock into the Caron river at Caron-shore, near the great Caron iron-works. From low-water in the Forth in Grangemouth lock, N2° 10', is a rise of 156 feet; the width of the canal is 36 feet at top, and 27 feet below, and the depth of water 8 feet; each lock is 75 feet long, and 20 feet wide in the clear, and values of 70 and 80 tons are used. This canal is crooked in 33 places by draw-bridges, has 33 culverts or arches under it, and 12 large aqueduct bridges; that over the Kelvin is 420 feet in length, and 70 feet high above the surface of the river, (see figs. 19, 20, and 21, Canals, Plate II.) and there is a large aqueduct which crosses the turnpike road from Glasgow to Stirling at Kirkintulloch. At Kilmananmurr is a scarp valve of 70 acres extent, and 22 feet deep at the sluice; and near Kilcruth is another of 50 acres, 24 feet deep for supplying the summit-level of this canal. In Bowlings-bay, and near the Kelvin aqueduct, are dry-docks, and other conveniences for repairing of vessels and boats. Mr. John Smout was first employed to survey this line in 1764, and he laid the present design, and executed a considerable part of the eastern end before 1775, when the work flood fell for some years, after which, Mr. Robert Whitworth was called in; he completed the remainder, and it was opened with great solemnity on the 28th of July 1792. The design of a canal between the Forth and Clyde has been at times entertained ever since the reign of Charles II., and besides the above engineers, since the year 1723, Meffrs. Gordon, Mackell, Watt, Brindley, Golborne, Thomas Yeoman, &c. have been consulted or employed. The canal was first made to commence in the Caron river, about a mile from its mouth, but was afterwards continued into the Forth at Grange-
mouth harbour. The proprietors were authorized in their first act to raise 200,000l. in 100l. shares; after which, 50,000l. of the public money was granted to aid the work; in 1785, 212,000l. had been expended, and no dividend or interest had been paid on the shares. The rate of tonnage is 0.5d. per ton per mile on all kinds of goods, except lime and lime-stone, which is to pay 1.6d. per ton per mile, while road-materials (except lime-stone) and manures are to pay toll free. For unloading or loading of British or Irish vessels in Grangemouth harbour, 1d. per ton is to be paid, (by 24 Geo. III.) and for foreign vessels 2d. per ton. Rafts of fir timber are allowed to be floated upon this canal and paid the locks, these often contain 70 tons each. An accident is related of a vessel coming down from the wellward on this canal, when the wind blew strong from that quarter, and not being stopped in time at one of the locks, the bore down the gates, and went down suddenly into the pound below. In December 1801, a vessel constructed by Mr. Symington, (as already described) was tried on this canal for dragging or towing boats, by the operation of a steam-engine; to the head of this vessel flappers were applied, that could be worked by the engine for breaking ice, when the canal is frozen over.

**FOSS-DYKE CANAL.** The general direction of this navigation is nearly S.E. for 11 miles, in the counties of Lincoln and Nottingham; it is upon one level, not much elevated above the sea, though a great distance from it, and presents the curious instance of a canal discharging its waste water into one river (the Witham,) while flood gates are necessary at the other end, to keep out the waters of the other river (the Trent); its object is a communication between these two rivers, for supplying coals and exporting farm produce. Lincoln is the 76th British town, with a population of 7,4598 persons. This canal commences in the Trent river at Torksey, and terminates in Brayford pool, a natural pool in the Witham river, near Lincoln. It has a lock at Torksey, constructed on the principle of a sea-lock, that is capable of penning the water into the canal, or out of it, according to the circumstances whether the Trent or it may be the lowest; between Brayford pool and Lincoln high-bridge, a hard of gravel or shallow, called Brayford head, held up the water in this canal, to about 23 feet deep, which otherwise would, in dry times, have been emptied into the Witham, too low for navigation. Mr. John Smeaton and Mr. John Grundy were consulted in 1792, and the former engineer again in 1782, when he recommended raising the banks of this canal to obtain a better depth of water, cutting off its connection with the Witham by a pound-lock, and supplying it with water by an aqueduct or feeder, from a reservoir to be made near the Witham, south of Brayford pool. We are not acquainted with the date when this canal was first dug or made navigable; Mr. Ellifon's wharf thereon, near its east end, was, it appears, built about 1765.

**Foss Navigation.** Acts 33 and 41 Geo. III. The direction of the Foss river, which this navigation follows, is nearly N. by a crooked course of about 13 miles, through the North Riding of Yorkshire: its elevation is not very great above the level of the sea; its objects are the supply of the city of York, the import of coals for the use of the adjacent country, and to effect a better drainage of the same. York is the 23d British town, with 16,145 inhabitants. This navigation commences in the Ouse river at the city of York, and terminates at Stillington mill. It is fed by a reservoir on Oultone moor: it appears that the corporation of York were by a licence of king Richard II. required to erect and maintain proper bridges over this river. This company were authorized to raise 45,400l. the amount of shares being 100l. each. The rates of tonnage will be found in Phillips' 4to. History, Appendices, p. 81 and 82; and in the last act, by which an additional 15d. per ton, on heavy articles, were imposed, and by which the proprietors were authorized to proceed no higher than Sheriff-Hutton bridge with their works, until the necessary funds were accumulated to proceed with the remainder of their line. Some years ago, a pleasure-boat, made wholly of sheet iron, was tried on this navigation, 12 feet long, and capable of carrying 15 persons, and yet so light that two men could carry it.

**GLAMORGANSHIRE CANAL.** Acts 30 and 36 Geo. III. The general direction of this canal is nearly N.W. for 25 miles, in the county of Glamorgain South Wales. Its objects are the export of the produce of the immense iron, coal, and lime works in the neighbourhood of Merthyr Tydil, &c. and the supply of the rapidly increasing population thereof; at Eglwysilan the Aberdare canal joins, and the Cardiff and Merthyr railway runs by its side, and joins it at thofe two places. Its northern end is considerably elevated. Cardiff and Caerphilly are considerable towns on or near the line; it commences in a sea-bason, or dock, in the Severn, at the Lower-layer near Cardiff, and terminates near the town of Merthyr; it is a railway-branch from Merthyr to Dowlais iron works. From the tide-way at Lower-layer to Merthyr is a rise of near 600 feet; and while of this distance the canal skirts precipitous mountains at the height of near 300 feet above the river Tav or Taaff, which it closely accompanies throughout its whole length. The floating dock at Lower-layer is 16 feet deep, in which a great number of ships, of 300 tons burthen, can lie conveniently afloat, and load or unload, either at the spacious warehouses on its banks, or from, or to, the boats belonging to this canal, or the trains used on the Cardiff and Merthyr railway, that here commences. There is a large aqueduct bridge over the Tav near Gallygare. This company were authorized to raise 100,000l. and to the powers for raising the last 100,000l. this singular condition was annexed, viz. that the whole concern should be completed within two years, after which no further money should be applied, except for repairs. At Merthyr there is a famous water-wheel, made of cast-iron, 50 feet diameter, at Mr. Crawfords works; the water being conveyed thereto for a great distance in an iron aqueduct.

**Glasgow and Saltcoats.** In May 1803 the line of country between the Clyde river at Ardrossan, near Saltcoats, and the Clyde river again at Glasgow (pausing Paisley and connecting with the Cart river) was surveyed by Mr. John Rennie; in 1805, the subject was revived, and met the support of the earl of Eglington and many others, coupled with the design of building a pier on a ledge of rocks near Castle Craigie, and forming wet-docks, &c. to be called Ardrossan harbour, for which an application was made to parliament in the same year. At Glasgow this canal would connect with the Greenock and Clyde, the B'Verkland, and the Edinburgh and Glasgow: the line thereof is through a country rich in coals and lime-stone.

**GLENKENNS CANAL.** Act 42 Geo. III. The direction of this canal is first N.E. and then N.W. for about 27 miles, in Glenkenins, in the county of Kirkkudbright in Scotland: it is not very greatly elevated; the object of it is the export of the coals, iron-stone, and other minerals with which the country abounds; Kirkkudbright and New Galloway are considerable towns near the line. It commences in the tide-way in the Dee river at Kirkkudbright, and terminates in the boat-pond at Dalry. There is provision made for branches to the neighbouring mines and railway-ways, and inclined planes may be substituted, instead of a canal and locks in any part. The company is authorized to raise
A tunnel the I' Phillips' 127 thence is 1,.. g population Adingham has miles 'miles 25^ Naafown The yai [n n irri agitation. it; this! panes t tub- 1 u coal new tut feet. nearly 48^ i)H'^ < the it or tl\ L. In 5 fmce paffes thi cginii Glouceftcr nearly canai, in

William Heslop, &c. In the year 1779 this canal had proceeded from Dublin into the town of Allen, when, owing to mismanagement, it flood fill for several years, and it was not until the beginning of 1804 that the whole line was firi nished and opened. The sums of the public money which have been granted by the parliaments to aid this work are immense; between 1753 and 1771 they amounted to 78,211. It has been proposed to reduce the falls or tonnaage since the opening of this canal. In the beginning of the present year (1805) it was proposed to continue a branch from this canal, near Athy, for 9 miles, to the foot of the Drumne Hills, in Queen's county, and thence to tunnel two miles into the hill, to drain the rich veins of coal therein, and bring out their produce.

Grand Junction Canal. Acts 35, 36, 37, and of Geo. III. — The general direction of this canal is nearly north-west for 921/2 miles, in the counties of Middlesex, Hertford, Buckingham, Bedford (a very small distance), and Northampton. It has a summit of considerable height near Tring, which it passes without a tunnel; and near its northern end it crosses the grand-ridge by a tunnel. Its principal objects are, a communication between the metropolis and the various canals of the midland counties, the supply of coals, deals, flake, &c. to the several towns on the line and branches, and the export of the agricultural products, lime, flints, &c. of the country through which the canal passes; at Northampton it joins the Nene river by a rail-way branch, and the same is intended there also to join the Leicestershire and Northamptonshire Union canal. London, as is well known, is the first town in Britain for population, with 864,845 inhabitants, and Northampton is the 85th, with 7,260 persons; Brentford, Uxbridge, Rick manworth, Watford, St. Albans, Hemel-Hempstead, Berk hamstead, Tring, Wendover, Aylesbury, Leighton-Buzzard, Fenny-Stratford, Newport-Pagnell, Stony-Stratford, Buckingham, Towcester, and Daventry, are also considerable towns on or near this canal or its branches. The commencement of this canal is in the river Thames, near the extremity of the tide way at Brentford creek, and its termination in the Oxford canal at Braunston. From Bull bridge a branch, 131/2 miles in length, goes to Paddington, one of the environs of Lon don; to the town of Rickmansworth, there is a cut of about 4 of a mile, with a lock at its entrance; from Bulburne head a branch extends for 63/2 miles to Wendover; from Cropgrove a branch of 1 1/2 mile extends to Stony or Old Stratford, and thence 9 1/2 miles further to Buckingham; and from Gtayton a rail-way branch of 5 miles extends to the river Nen, and the intended termination of the Leicestershire and Northamptonshire Union canal at Northampton. To Watford a branch of 2 miles, and thence about 5 miles farther to St. Albans, has been surveyed and provided for in the acts; another to Aylebury of about 6 miles, and another to Daventry of 1 1/2 mile in length, but these last are not executed. From the Thames at Brentford to Two-waters is 223 miles, with 269 feet rise; thence to Cropgrove is 7 1/2 miles, with a rise of 127 feet; thence to the Wendover branch is 3 1/2 miles, of the highest summit-level; thence to the crossing of the Ouse river, between Wolverton and Cropgrove, is 2 3/4 miles, with a fall of 192 feet (this being the lowest place); thence to Stoke Bruern is 3/4 miles, with a rise of 112 feet; thence (through the Blisworth tunnel) to the south end of Whilton parish, 1 1/2 miles, is level; thence to Whilton mill, in Long Buck by, 24th of a mile, is a rise of 60 feet; thence along the summit-level, and through Braunston tunnel to its north end, 4 1/2 miles, is level; and thence to the Oxford canal at Braunston, near 1 mile, is a fall of 37 feet. The Paddington branch is level (at about 50 feet above the Thames, and 43 feet above the Strand-pavement at Exeter change).
change. The Wendover branch is level, and connects with the Bulbourne or Tring summit pound: the Buckingham branch has a rise of 15 feet; the Northampton branch has a fall of 120 feet, and the cut to Daventry is to have a rise of 60 feet. The width of the main line is 36 feet at top, about 24 feet at bottom, and 4½ feet deep in water: the Wendover branch is 28 feet wide at top, 18 at bottom, and 4½ feet deep; and the Buckingham branch is only 20 feet wide at top, 10 at bottom, and 4½ feet deep in the general. The Northampton rail-way, which is now (October 1805) nearly or quite finished and ready for opening, is of iron, and double, that is, has two roads for the carriages going different ways. The locks on the line are 86 feet long, 15 feet wide in the clear, and rise about 7 feet each on the average, requiring about 9330 cubic feet, or 250 tons of water to fill them each time that a barge passes. On the line there are 101 locks, besides the 9 spare ones in Wolvarton-valley 3 on the Buckingham branch there are 3 locks. Two kinds of vellies are in use upon this canal, barges with square heads and flaps, and flat bottoms, that carry 50 tons, and boats with sharp ends, or nearly so, of half the width, that carry 25 tons. At White-friars, just above Blackfriars-bridge, on the Thames, this company built extensive warehouses, over a dock, in which barges lay afloat from one tide to the next; there are now let to Mr. Pielford, the great waggons and boat-maker. At Paddington a spacious bason or straight out, 400 yards long and 30 wide, has been formed with wharfs at its head, and others are daily extending wellward along its sides; behind this, on the north side, is a spacious yard for a vegetable and a hay and straw market, with immense sheds, under which loads of those articles can stand in the dry when it rains; and on the south side pens are erected and provision made for a large cattle market. The number of wharfs erected on this extensive line and its branches by individuals are too great for us to attempt to particularize them. The number of culverts or small water-courses under the canal and its branches are very great. And on the towing path there are a number of large and high wooden bridges for croffing the entrances to branches, docks, or over streams of water; for some distance from Paddington provision is made under the bridges for a towing path on each side of the canal. The tunnel between Stoke-Breram and Bliworth (already described), is 3060 yards in length, 17 feet wide, and 19 feet high, at 66 feet below the top of Bliworth hill, through which it penetrates. Braunjton tunnel, between that place and Daventry, is 2435 yards in length: another tunnel was at first intended near King's-Langley for avoiding Chalishobur, and other parks in the Colne valley; but an agreement was afterwards come to with their owners for a passage through them, instead of tunneling. Between Cow-rost and Bulbourne there is an immense deep-cutting for passing the great range of chalk-hills near Tring; this extends for 3 miles, and is 30 feet deep in the highest part; near Dawley there is a great length of deep-cutting through the immense bed of gravel at that place; at the ends of the Bliworth tunnel, and at several other places there are also deep-cuttings. Between Wolverton and Cosgrove a stupendous embankment, with three aqueduct arches under the same, has been constructed, since the locks were made for croffing the Ouse river, as above mentioned, over which the canal has, since August 1805, been conducted, and by which 4 locks on the south side of the valley, and 5 locks on its north side, are avoided, except a lock of 18 inches rife, near the north end of the embankment, by which 12 miles in length of level pound is held up (on the line and Buckingham branch), and separated from 10 miles of level pound south thereof, to beyond Penny-Stratford town, (where another lock of only 18 inches rife occurs, to build up a pound of fome miles in length that was intended, but for a mistake in the levelling, to have been in one pound); this embankment is ¾ a mile long, and 30 feet high, where it crosses the Ouse. At Weeton-Beck, and at Bugbrook, there are also moft stupendous embankments, and river and road aqueduct-arches, and many leffer embankments and aqueduct bridges occur on the line and branches: those over the Brent river, and over Bays-water on the Paddington branch are considerable. On Harefield Moor there is a very wide and large piece of water on the canal: others at Great Berkhamstead, at Halton park, and two other places on the Wendover branch. Five considerable reservoirs have been constructed for preserving water for this canal, or the mills, whose streams have been diverted for its use; that at Aldenham covers 68½ acres, at Willi:one is one of 5 acres, and that at Watton-Turville, Braunjton, and Daventry, are all of very considerable dimensions. The principal feeder for the southern summit is at Wendover, and there are others at Little Tring, Tring, and Milswell (the last being arched over for ¼ of a mile). The middle and lower part of the line is supplied by a feeder at Soulbury, and the northern summit is supplied by a feeder from Watford, near Daventry: besides which, that summit has had its banks raised to accumulate an extra depth of water in wet times, and a steam-engine has recently been erected for pumping the water out of the level of the Oxford canal to that summit, that is let down therefrom by the lockage. At Little Tring an engine was, in June 1803, erected for pumping the water collected in Willi:one reservoir into the Wendover branch of the southern summit-level; and at Nash mill, some distance below Two-waters, in the Colne valley, an engine is now erecting to return the lockage water of 4 locks that are there placed near to each other. On the north and south sides of the Tring summit, several pairs of tide ponds have been lately added to the locks, for having part of their consumpation of water. Where the Towcelfter river (the Tove) is croffed and joined there are very considerable weirs or tumbling-bays, and others on the old course, in the Wolvarton valley; and, between Great Berkhamstead and Uxbridge, there are continually occurring, owing to the canal having unfortunately been conducted into and through almost every little stream, that overfalls of lefs size are also very common on every part of the line, so are stop-gates, trunks, and every other necessary appendage and convenience to a navigable canal. Mr. William Telford was the engineer to this extensive concern; Mr. James Barnes and Mr. John Holland were employed in executing different parts of the works, on which Mr. Thomas Telford was lately employed to report his opinion; since 1803 Mr. Benjamin Bevan has been employed in repairing the leaky parts, constructing tide-ponds, &c. in the middle district of this canal. The works on this canal commenced at both of its extremities, soon after the passing of the first act; and the tunnel at Braunjton being completed, the navigation was opened, in July 1796, as far southward from the Oxford canal, as the great embankment at Weeton Beck; in June 1797, the same was extended to the next great embankment at Bugbrook; and about November in the same year, to the north end of the intended tunnel at Bliworth. Beginning at the southern end in the Thames, the navigation to Two-waters was completed in June 1798, and in June 1801 the branch thence to Paddington was opened; in the year 1799, the canal was completed to Bulbourne, and the branch thence to Wendover; in June 1806, it was extended to Penny-Stratford; and about December 1813, to the fourth end of the intended tunnel at Bliworth; at the same time a double iron rail-way of near 3½ miles in length (since removed) was laid across Bliworth Hill.
Hill, to connect the two parts of the canal, and form the much wished for grand junction; in May 1801, the branch to Buckingham was opened; it was not until March 1805 that the Blisworth tunnel was completed, and the navigation of the whole line opened; and, firstly, in August 1805, the immense Wolverton embankment was opened for improving the same, and avoiding 8 locks, but which locks still remain by its side, as a referee, in case of accident, to this immense mound of earth, or the three large arches under it. This company were authorized by their first nine acts to raise 1,453,000l. to which their first act of last session made a considerable addition; and it is feared that the expenditure will altogether exceed two millions sterling. The shares are of 100l. value each, which have at some periods of the businesf sold as high as 210l., and at others have been down at 65l. Shares in this concern are allowed to be split into such small portions among different holders, as 4th or 8th each. On the original shares no dividend or interest has yet been received, but now, as the tolls amount to full 7,000l. per month, it is hoped a dividend will begin to be made. Inland canals from the rich and inexhaustible mines with which this and other canals form direct communications, were forbid under severe penalties (although two legislative attempts to enforce the same proved inefficient) to be brought nearer to London than the N.W. end of Grove park in Hertfordshire, until the last act of the late session mentioned above, by which 50,000 tons of such coals are allowed to be brought to Paddington in the current year, on paying a duty equivalent to that paid in the Thames on sea-brought coals. The market at Paddington, after an ineffectual and most extraordinary opposition from the city of London, was opened in May 1802, for the sale of fat cattle, hay, straw, corn, vegetables, &c. By the act 41 Geo. III., this company was authorized to lay pipes in certain streets in Paddington, Mary-le-bone, &c. for supplying the inhabitants with water; but at that time, certain millers, whose dams the line had been made to pass through, were not consulted. In June 1801, packet-boats were established, that continue to pass regularly at stated hours during most of the year, for the conveyance of passengers and parcels London and Uxbridge; and for some time after the opening of the Buckingham branch, a boat went regularly between Paddington and that town; but to which number of passengers and parcels a were found inadequate to support the expense of such an establishment. Trading boats are not allowed to pass along upon this canal except in the day time, unless such as have a special licence from the company for such purpose. Mr. Pickford has a great number of boats, which proceed as regularly day and night upon this canal, and the other canals north of it, as the mail-coaches do on the roads, although with less expedition. A common trading boat has been known to arrive at Paddington in 63 hours from Coventry. In December 1799, the experiment was first tried, of bringing fat Oxen to London in boats by means of this canal. The rates of carriage on this canal were at first very low, as will be seen in Phillips' 4to. History, Appendix, p. 91. Additional tolls were provided in the 43d of Geo. III. for passing the Blisworth tunnel and Woolveton embankment; and by the first act of the last session (45 Geo. III.), the rates on the whole line and branches were varied, and increased for short distances. The act of the 33d provided certain rates, which are to be paid to the Oxford company (See Phillips' Appendix, p. 93.) for goods passing thereto or from this canal, and this company is bound (since the beginning of 1804.), to make up the same to the amount of 10,000l. per annum. This company is also bound to pay annually to the city of London the sum of 50l. for the liberty of making a junction with the Thames; and all goods, passing into or out of the same, are to pay 3d. per ton, to be applied towards improving the middle navigation of the Thames river. The intended cut to Aylesbury was, on account of the scarcity of water at Marlow, where it was to join the line, changed for a railway, and in the year 1803, the same was begun; the iron rails were actually purchased, and brought to the spot, but, alas! in one of those revolutions of fortune to which borough towns are ever liable, the work was stopped, the rails were ordered to be sold, and years may now perhaps elapse before Aylesbury is permitted to enjoy the advantage of a canal or railway communication. About the year 1799, an extension of the Rickmansworth branch of this canal was proposed to the town of Chesham. In 1793, and again in 1802, it was proposed to extend a branch from near Slapton to the foot of Puddle-hill between Dunstable and Hucknall; one object of which was the export of the valuable white freestone from the quarries at Tottenhoe; this object may, however, it is presumed, be obtained without such a cut; and some of equal quality be got in several places on the summit branch. In the year 1802, the country westward of Uxbridge was surveyed by Mr. John Holland, with the intention of extending a branch of this canal from below Cowley lock, (continuing the level of the Paddington water) to the Thames at Harlesdon in Great Marlow parish; it was also proposed, after crossing and uniting with the Thames at this place, to extend this branch, by a rise of three locks, to a side-cut of the Kennet river at St. Giles's in Reading, with a branch therefrom to the Thames at Summing: the objects of this branch were, a more direct communication with the Bridgford channel, by means of the Kennet and Avon canal, the supply of the country bordering on this canal and its branches with peat manure from near Kedington, the better supply of, and communication with London, by means of a canal without a lock, between the Thames at Great Marlow, and Paddington, the gaining from the Thames that supply of water, which had been denied from the Colne for the intended water-works, and the lockage of the London canal; which, in 1802, proposed to extend from the Caen of this canal at Paddington to the London Docks, and thereby to communicate with the Thames; after which a railway was, in the same year, proposed to extend from Paddington over nearly the same ground. It was before 1773 that a canal was first proposed from Paddington to Uxbridge, nearly in the route of the line now accomplished; and in 1773, Mr. James Sharp proposed an extension of this to the Kennet river. In June 1803, a survey was taken for extending the intended Aylesbury branch by Tame to the Thames and its navigation, and Wilts and Berks canal near Abingdon. And in the same year, the Leicestershire and Northamptonshire Union canal was proposed to be joined to the line of this canal at Long-Buckby wharf near Daventry, instead of joining its Northampton branch at that town.

**GRAND SURRY canal. Act 41 Geo. III.**—The general direction of this canal is nearly S.W. for about 12 miles, by a crooked course in the county of Surry, and through a small part of Kent. It is not greatly elevated in any part of its objects are the supply of the neighbourhood through which it passes with coals, deals, manures, &c. the bringing of vegetables, and other articles for the supply of London: forming a communication between three points of the Thames river, and with the Croydon canal, which it joins near Deptford. It commences in the river Thames at Wilkinson's gun-wharf in Rotherhithe, and is to terminate at the town of Mitcham; near Wallworth, a branch of about 2 of a mile goes off to join the Thames at Vauxhall.
Vaughall creek by Cumberland gardens. There is to be a
cut of near 1½ mile to Horfemonger lane; another of ½ a
mile to Peckham; another of one mile to But-lane Dept-
ford; another of ½ of a mile to his majesty's victualling
office and the dock-yard at Dapford, and another of ½
of a mile into Greenland dock, by which it will again
communicate with the Thames river.

From the river Thames to the junction of the Croydon ca-
nal the distance is 2 miles, and nearly level with high
water in the tide-way of the Thames, at which height the water is
to be held up by tide or entrance locks; thence to the Vauxhall
branch at Kennington common it is 3 miles and level;
then at Brixton-cutoff, ⅔ mile, it has a considerable
rise; thence to the proposed Kingston branch, ⅔ miles, it is
level; and thence to Mitcham town it is ¾ of a mile; the
Vauxhall, Horfemonger-lane, Peckham, But-lane, King's
yard, and Greenland-dock branches, are all level. This
channel is calculated for wide or river boats; near the
commencement, at Wilkinford's wharf, a large basin is
designed, and a smaller one at But-lane near the Greenwich road:
across Rotherhithe to Brixton-cutoff an inclined plane
is intended. Mr. Ralph Doll was, we are told, the con-
tractor of this canal, and under his direction the works were
begun, and considerable progress made between Rotherhithe
and the Peckham branch; but for more than two years past,
little further progress appears to have been made.

The company were authorized to raise 60,000l. in 1001. shares.
The tonnage on this canal varies from 2d. to 6d. per ton per mile
on different kinds of goods. The company are to pay a rent
of 60l. per annum to the city of London for communicating with the
Thames river. Collateral cuts to the extent of 1,500 yards may be made by consent of the land owners.
In 1803, it was intended to extend this canal 6½ miles fur-
ther to the Thames river on the south side of the town of
Kingston, which was to pass the Survey iron road-way at
Merton abbey, by an aqueduct bridge 11 feet high in the
clear, and the Wandle river by another 15 feet above its
surface; from Norbiton common this was intended to branch
again to the town of Epsom, 5½ miles, and from Mitcham
the canal was there also proposed to be extended to the town
of Croydon. In the same year there was also a pro-
posal for extending the intended Kingston branch to the
Wey river (near the commencement of the Basing-fleake canal),
as part of one of the lines between Portsmouth and London.
The Croydon canal company are to have a dock or basin for their
boats by the side of this canal near the Thames at Rotherhithe;
which when the entrance lock and basin of this canal, are now
cuttin, and form on a scale calculated for small ships.

Grand Western Canal. Act 36 Geo. III.—The
general direction of this canal is nearly E.N.E. for about 35
miles, in the counties of Devon and Somerset: it crosses
the eastern branch of the grand-ridge; its objects being a
connection between the southern coal and the Bristol
channel, the supply of the country with coals, deals, &c.
and the export of farming produce. Exeter is the 1st
British town, with a population of 17,508 persons; Wil-
lington is the 73d, with 7,532 persons; Tiverton the 24th,
with 6,505 persons, and Taunton, the 108th, with 5,704
persons; Topsham, Bradninch, and Cullompton, are also
considerable towns near this line; which commences in the
tide-way of the river Exe at the town of Topsham, and termi-
mates in the Tone river at Taunton bridge; it has a cut of
about seven miles to Tiverton, and other short ones to Cull-
ompton and Wellington. It is provided, that the brick
bridges shall not have a rise of more than 2½ inches in a yard
on the aleent of the road over them. Two reservoirs are to
be made in the valley of the Culm river, and two in the
river Tone valley. Springs within 2000 yards of the line
may be taken, and cuts to any place within five miles may
be made by consent of the land owners. The company are
authorized to raise 35,000l., the amount of shares being
100l. each. We have not been able to learn that any pro-
gress is yet made in the cutting of this canal, although one
through this line of country has been so long desired, as
appears by Mr. Brindley's survey for the Exeter and Up-
bill canal, that was proposed in the year 1760.

Grantham Canal. Acts 37 and 39 of Geo. III.—
The general direction of this canal is nearly eall, by a crooked
course of 33½ miles, in the counties of Nottingham, Leic-
sfeft, and Lincoln: its eastern end is rather elevated.
Its objects are the supply of Grantham and the neighbourhood
through its course with coals, lime, deals, &c. and the ex-
port of farming products. Nottingham is the 17th Brit-
town, with 28,661 inhabitants; and Grantham the 89th,
with 7,914 persons; Bingham is also a considerable
town. This canal commences in the Trent river, near
Holme-pierpoint, (almost opposite the Nottingham canal,
to the Trent canal, and to the town of Nottingham,) and termi-
minates at the town of Grantham the Trent; there being a
branch of three miles in length to the town of Bingham.
From the Trent river to Cropwell-bishop, 63 miles, is a rife
of 82 feet; thence to Stainswith-clothes, 20 miles, is level;
thence to Woolthorpe point, 11 mile, is a rife of 58½
feet; and thence to Grantham, five miles, is level: the cut
to Bingham is level. This canal, which is through a clayey
district, is wholly supplied by proprietors, of which, one at
Denton is 20 acres, and nine feet deep, for supplying the
head-level; and that at Knifton for receiving the flood
waters of the Devon river, was 60 acres, and nine feet deep,
and in 1804, the bank or head of this last was raised four feet
higher. The company were authorized to raise 124,000l.,
the old shares being 103l. value each, and the new shares
(200 in number) 120l. each. The tonnage on all goods
pa\ning to or from this canal and the Trent river is to be
3½d. per ton, and 1½d. per ton per mile for navigating on this
canal: manures and road materials to pass toll free, ex-
cept lime-flone, which is to pay 3d. per ton per mile. The
Narrow and Bottesford canal was at this time (1793) in con-
templation to join this near Stainworth; and the tolls for
entrance therefrom, or on goods passing into that intended
canal, were settled in the first act above. The profits to the
proprietors of this canal are limited to a dividend of 8 per
cent. per annum, and after 5 years, are collected and de-
posited as a fund, the above tolls are to be lowered, as much as
circumstances will admit. The Trent river proprietors are to
take certain tolls on goods passing into or out of this canal
to the Nottingham canal, in consequence of their deep-
ening the river near the entrances to these canals; and goods
pa\ning from this canal on the Trent are not to be liable to
their new rates of 34 Geo. III. unless they pass on the
Trent canal, to be made under that act above Nottingham.

Grimes's Canal. Act 15 Geo. III.—The
direction of this canal is about N.W., and level, in the county of
Stafford: it is situated very near to the grand-ridge on its
eastern side. Its objects are the supply of the town of New-
castle-under-line with coals from Apdale collieries, and the
export of coals from the mines to the west of it, by means of
the Newcastle-under-line Junction canal, which now joins it at each of its ends. This canal was constructed at
the sole expense of Sir Nigel Grimes, bart., who was bound by
the act, for 21 years after 1775, to supply the inhabi-
tants of Newcastle with coal at £8 6d. per ton of 2,400lbs. or 3½d. by the single cwt. (£20 lb.); and during the
following term of 21 years, their price was not to exceed
In 1796, the Commercial canal was proposed to connect with this canal at each end, as the Newcote-under-line Junction afterwards did in 1798.

Grimsby Canal. Act 36 Geo. III.—This canal has a S.W. direction for 1/4 mile, in Lincolnshire; it is one of the largest cuts in England, and calculated to admit ships of 700 to 1,000 tons burthen. It commences in the tide-way in the Humber river near its mouth, and terminates in the spacious wet-dock in Grimsby harbour. The lock to this canal is 116 feet long, 36 feet wide, and the walls are 27 feet high; the cost of it, we are told, was £4,500. Besides the piling for the foundation, although bricks were delivered there at 1s. 6d. per thousand, and flume at 3d. per cubic foot. The depth of water in this canal is 20 feet; it was constructed, under the direction of that able engineer Mr. Robert Threlfall. In the year 1804, three acres more surface was excavated in addition to Grimsby wet-docks, and the same was re-opened, after a temporary interruption, on the 24th of July.

Harrow River. This river, or rather efluary, has nearly a north course for about nine miles, between the counties of Cornwall and Devon on their southern coast; it is frequented by the largest ships of the royal navy. Plymouth is the 9th British town, with a population of 43,194 persons; Plympton-Parke and Saltash are also considerable towns near this efluary, which commences in Plymouth found near Dawlish bay, and terminates in the river Tamar near St. Mellion. Near Warley the Towy river falls into it; and Cat-water, Sutton-pool, and Stone-houfe creek, are branches from this efluary. In 1767, Mr. John Swaton was consulted about a new bridge and causeway over Stone-houfe creek. In 1801, it was in contemplation to build a pier from Pinle to the better security of ships lying in Dawlish bay from the E.S. E. winds. By an Act of 45 of Geo. III. 4,000l. of the public money was voted towards cleaning and deepening Cat-water and Sutton-pool; and it is now in contemplation to construct a floating-dock in Sutton-pool capable of holding 100 merchants’ ships always afloat.

Hampton Gay and Isleworth Canal. In the year 1702, a canal was proposed, to take a course nearly N.W. for about 60 miles, in the counties of Middlesex, Buckingham, and Oxford; commencing in the Thames river at Isleworth, and terminating in the Oxford canal at Hampton-Gay. It was intended to effect that junction between the metropolis and the midland canals, which the Grand-Junction now accomplishes: it was to pass the chalk hills by a tunnel at Wendover, and to have a cut of three miles to Aylesbury.

Hartlepool Canal. This is only a very short cut of 300 yards in length, on the coast of Durham, from the sea into Hartlepool harbour; it was cut in the year 1764, at the expense of Sir John H. Dussell, through a solid rock, to the great depth of 19 feet. In 1796, Mr. Ralph Dodd proposed, we are told, some improvements of this harbour.

Hasingden Canal. Act 33 of Geo. III.—The general direction of this canal is nearly north for 13 miles, in the county of Lancashire; it is considerably elevated, crossing the Hasingden and Liverpool branch of the grand-ridge. Its objects are the export of the rich flours of coal, limestone, &c. on its course, and a communication between Manchester and the Leeds and Liverpool canal. Bury is the 84th British town, with a population of 7,072 persons; Hasingden is also a considerable town. It commences in the Manchester Bolton and Bury canal at Bury, and terminates in the Leeds and Liverpool canal at Church.
HULL RIVER, (or Hale.)—The course of this river or rather eltuary is nearly south for two miles, in the county of Cornwall, on its north-east coast: it commences in St. Ives bay, and terminates at the town of St. Erth: it is navigable only for small vessels, being almost choked at the entrance of the bay. In 1766, Mr. John Swaton was consulted on the building of a north-east pier at the entrance of St. Ives bay; the spring-tides here rise 26 feet.

HORNCastle NAVIGATION. Acts 3; and 40 of Geo. III. —The general direction of this navigation is nearly N.E. for about 11 miles, in the county of Lincoln; it is not much elevated above the sea: its objects are the supply of Horncastle and its neighbourhood with coals, deals, &c. and the export of agricultural products. Hornville and Tatterhall are considerate towns on this line. It commences in the old Witham river near Tatterhall, and occupies the site of Dyson’s and Gibbon’s former cut to Tatterhall, passing that town to Horncastle by the course of the Bain river. The company were authorised to raise 45,000 l., the amount of each share being 50l. The dividends are not to exceed 8 per cent.; but after 1000l. is accumulated as a fund for contingencies, the tolls are to be lowered, to keep the profits within that limit. The first rates of tonnage are given in Phillips’s 4to History, Appendix, p. 24, but these were varied and increased by the last act above. This company purchased the old Tatterhall canal, and were, by their first Act, to contribute jointly with the Witham and Seafoord companies in the expenses, during the next seven years, in improving and deepening the course of the Witham between Lincoln high-bridge and the Penfold-ridge canal, in order to facilitate the passage of goods to and from the Trent river, and in consequence, but half the accumulated Witham dues were to be paid for goods passing to and from this navigation. In September 1802, this navigation, and the baloon at Horncastle, were completed and opened.

HUDERSFIELD CANAL. Acts 33 and 40 of Geo. III. The general direction of this canal is south-west for 154 miles in Yorkshire and Lancashire; it crosses the Grand-Ridge, at a great elevation, by one of the longest tunnels in this kingdom, in a rocky mountain: its objects are the carrying of coals that are found both in its extremities, the supply of part of the country with lime, the conveyance of farming produce to the great towns, and the forming of a more direct communication between Hull and Manchester and Liverpool. Hudersfield is the 9th British town, with a population of 7230 persons: Alton-under-ridge is also a considerable town. This canal commences in Sir John Ramsden’s canal near Hudersfield, and terminates in the Manchester Alton and Oldham canal, at Duckenden Bridge, near the town of Alton-under-ridge (near which the Peak Forest canal also joins it). From Ramsden’s canal to Marford the distance is 72 miles, with a rise of 436 feet; thence and through the tunnel to near Saddleworth it is 4 miles, and level; and thence to the Manchester Alton and Oldham canal, 15 miles, is a fall of 334 feet. The lock at the entrance from Ramsden’s canal is 8 feet wide, this canal being only intended for narrow and long boats. The Tunnel through the Stannage Hills near Marford is to be three miles in length, near to which, on the summit-level, the company are authorized to make reservoirs to contain 20,000 lock-falls of water, (each 180 cubic yards), and may make others if they prove insufficient. About the year 1798, that part of the line between Hudersfield and Marford was completed and opened; in the same year the head of a large reservoir near Marford broke, and the torrent of water let down thereby did considerable damage to the country below it. The company are authorized to raise 274,000l.; the amount of shares being 100l. These became greatly depreciated in value, about the year 1800, owing principally, it is supposed, to many of the original subscribers not being able to answer the calls for money, by which the works were retarded, and the canal remained in an unproductive state: the Tunnel under the Stannage Hill is now proceeding. The rates of tonnage are from 4d. to 3d. per ton per mile for different goods, (see Phillips’s 4to History, Appendix, pp. 135, 136.) besides which is 6d. per ton is to be paid extra, on all goods which pass through the tunnel: let’s rating than 15 tons is not to pass any lock, unless the water runs wide thereof, without constant; no rates are to be taken by Sir John Ramsden for the goods which pass between his workhouse at Huddersfield and this canal, this company to amend and keep that part of his canal in repair, in consequence, and are to guarantee his tolls not being lessened, taking an average of three years before this canal is cut. This company is also bound not to make any branch or extension of the canal to any other navigation to the eastward; but, in such case, the tolls thereof are to be divided between Ramsden’s, the Calder and Hold’s, and Ayre and Calder proprietors, instead of being taken by this company.

HULL CANAL. The course of this river is nearly north, for about 12 miles, in the East Riding of Yorkshire; it is but very little higher than the sea: its objects are the supply of Beverley and the adjacent country with coals, deals, &c. and the supply of Beverley and Hull with farm produce. Kingston-upon-Hull (or Hull) is the 16th British town, with 29,416 inhabitants; and Beverley is the 45th, with 6001 persons. This navigation commences in the tide-way of the Humber at Hull, and terminates in the Driffield navigation upon the same river at Aike-beck mouth. In Leven parish (between Ecke and Leven-bars) this is joined by the Hull and Leven canal.

HULL AND LEVEN CANAL. Acts 41 and 42 of Geo. III. The course of this canal is nearly easterly for about three miles, in the East Riding of Yorkshire; it is in a very low situation; its objects are the supply of Leven town, of lime to the country east of it, and the export of the agricultural produce thereof for the supply of Hull and Beverley. It commences in the Hull river, and terminates at Leven bridge. Mrs. Cleasby Bethell is the sole proprietor of this canal, on which Mr. John Dennis, Mr. William Jefcoft, and Mr. France were consulted. This canal was finished some time ago; and the act of last session was for raising the tolls, which were found disproportionate to the expense of its construction and management.

HUMBER RIVER. Act 23 Henry VIII.—This noble river, or rather eltuary, has nearly a west direction for about 40 miles between the counties of York and Lincoln. The tide flows with great rapidity through its whole length, and the depth of water is sufficient for ships of considerable burthen, which trade in valn numbers to the port of Hull, and with the numerous eastern rivers which connect with it. Hull contains, as above stated, 25,316 inhabitants; and Barton is the 95th British town, with 6197 persons. Grimby, Pattrington, Headon, and Burton are also considerable towns on or near to this river. It commences in the German Ocean at the Spurn Head, and terminates in the Ouse and the Trent rivers, at their junction at Trent-fall: it is joined at its mouth, near Ternay, by the Louth river; at Grimby, by the Grimby canal and docks; at Kingston-upon-Hull, by the spacious Hull docks and by the Hull river; in Wintringham, by the Ancholme river; and at Pools-duck; a few miles, by the Market-Weighton canal. The port of Hull, and the communications of this river, have been greatly improved, by the constructing of
wet-docks at Hull; the acts 14, 42, and 45 of Geo. III. having failed for these purposes, the first dock was opened in September 1798. In 1802, the new Harbour-dock was proposed, from Myton-gates to Hesel-gates, on the site of the old ramparts, to form four acres of water, to which a 50 gun ship may have access from the Humber, and 70 feet of ships may lie conveniently, to be surrounded in part by spacious warehouses. By the act for the same, 30,000l. in 1803, was to be raised: these shares have since borne a premium of near 50 per cent. The act of the late session was for raising more money to complete this vast undertaking, now in great forwardness. In September 1822, a small dock was begun on the shore of the Humber for market and ferry boats; a number of dolphins or floating buoys were, about the same time, placed on the banks of the river. In 1774, Mr. John Smeaton was employed to build two light-houses on the Spurn Head, at 500 yards apart, which, in June 1776, were in imminent danger of having their foundations undermined by a great gale: in September 1803, the lowell of these light-houses was burnt down by accident. Coal-ships, palling the Humber's mouth for London market, pay 1d. on each charge of their cargo, towards the support of these lights. In 1829 it was in contemplation to erect a light-house at Stallingborough, on the fourth shore of the Humber. In 1802 the Gillingham and Hull canal was proposed, to connect with this river at Hull; in the same year, the Keyingham-Level navigation was proposed to join at Stone-creek. In 1805 the Heckno and Paul canal was proposed to connect with it at Paul.

Isle of Wight. The course of this river is nearly as well for about 10 miles, in Nottinghamshire: it commences in the Trent river at Stockwith, (near to the termination of the Chesterfield canal,) and terminates at the town of Bawtry. At half a mile from the Trent is Misterton fast or flounce, with an opening of 173 feet, and two lock-doors 16 feet high, opening towards the Trent, to keep the floods thereof out of the low lands through which this river passes. In 1764, Mr. John Smeaton was consulted on this navigation and drainage.

Inverness and Fort-William Canal. Acts 4. 44, and 45 of Geo. III.-This grand or Caledonian canal, as it is sometimes called, has nearly a south-west direction for 50 miles, in Inverness and Argyle shires, in the Highlands of Scotland; it passes the Grand-Ridge, through a low part thereof, interfaced by deep lakes or lochs: its object is a connection between the East and West Seas, by Linne Loch and Murray Firth, for large ships drawing near 20 feet of water, and for avoiding the northern voyage by the Orkinays, or through Pentland Firth. Inverness is the 63rd British town, with a population of 8,732 persons. Nairn, Cromarty, and Fort-George are also considerable towns on this line. It commences in the 6th mile in Loch Beauty at Clachnacarry basin, and, after passing through two large and two small inland lakes, it terminates in the tide-way in Loch Et on Carphat basin. From the sea-lock at Clachnacarry to the 20 lock, about 3 of a mile, it is level, with high water in Loch Beauty, and nearly parallel thereto; thence for one mile to the 6th lock is a rise of 45 feet by 5 locks; thence through Lochs Doughfour and Nefs to Fort Augustus is 28 miles, and level; thence to the end of Loch Oich at the 13th lock, 54 miles, is a rise of 53 feet by 7 locks; thence through Loch Oich, and the deep-cutting on the grand ridge west of it, is 54 miles and level; at the end of which the lock N° 12, at the east end of Loch Lochy, makes a fall of 19 feet; thence through Loch Lochy to near Tor Castle is 1/4 miles, and level; and thence to the sea-lock at Corpach, 31 miles, is a fall of 50 feet by 10 locks: in all 23 locks, having 60 feet or extra locks. This canal in 152 feet wide at top, 50 at bottom, and 20 feet deep; the locks are 152 feet long and 28 feet wide. At Clachnacarry and at Corpach are locks, each 400 yards long and 74 yards wide. Twenty-two miles of this navigation is through a branching forth water lake, called Loch Nefs, of 7 to 14 miles in breadth, the middle part being 110 fathoms in depth! and its bottom muddy: this Loch and the next, never freeze, and it is said that the waters thereof do not corrod iron. Loch Lochy is another large lake, 104 miles in length, and from 4 to 8 miles in width, and its greatest depth, 17 fathoms, through which this navigation passes: it has a ferme little harbour, 102 fathoms long and 150 fathoms wide, at its eastern end. Another smaller lake is found on this line, called Loch Oich, 44 miles long, from 4 to 7 mile wide, and 29 fathoms in depth in the deepest part, its bottom being a soft mud. Loch Doughfour, the remaining one of the four, is 14 mile long, about 4 mile wide in its widest part, and about 40 feet deep. The number of lying buoys is 80. Here are 5 culverts, with 100 arches each, and an aqueduct of 240 feet across Lady Bridge: the deep-cutting near Largans is to be 45 feet deep on the summitt, and is estimated to cost £1,126,000. New canals are required to be cut for the river Speen, and for Fort Augustus for the river Nefs: the steep hills adjoining, rendering it necessary for the canal to occupy the old bed of the river for some distance in those places. A large weir is to be made at the east end of Loch Doughfour, to hold its waters to the level of Loch Nefs, and several smaller weirs are to be made. Loch Oich is to be deepened 1,540 yards in length, at the expense of £1,550,000. This canal is now only supplied with water on the summit, not only for the lockage, but for the working of mills out of the different pounds, which will doubtless hereafter prove of immense advantage to the country. In 1774 Mr. Watt was employed to survey this line, who estimated a 12 feet deep canal, in the place of the present one, to cost £140,000, exclusive of the land. In 1801 Mr. Thomas Telford was employed by Government to survey the canal above described, affiled by Mr. Murdoch Downie, very full particulars of which will be found in the Report, printed by order of the house of commons 14th June 1803 and 10th of April 1804; in which Mr. William Jeffry's estimate, amounting to £74,531. (exclusive of 23,000l. for land and mooring-chains) is given; and walled locks are recommended. On account of the loss of time in filling the chambers of those unwatered. By the first act above, 20,000l., by the next 75,000l., and by the last 50,000l. of the public money were granted, for carrying on this great work, under the direction of Mr. Thomas Telford. In October 1805, four miles in length next Inverness were digging, and the entrance basins were in hand. In August 1815, the new channel for the river Nefs was cutting, the first lock new Inverness was building, 1000 men being employed at this end. It is proposed to place mooring-chains on the shores of Lochs Nefs and Lochy, on account of their being too deep for good anchorage. On Loch Nefs government have had a galley of 75 tons burden since 1737, in which period, to 1843, three of them had been worn out; the storm so fatal to wood in some waters is not troublesome here. At Inverness the spring tides rise 11 to 13 feet, and the neap tides 7 feet; at Fort William they rise 12 and 5 feet. Cromarty Bay in Murray Firth, about 18 miles east of the beginning of this canal, was surveyed by Mr. Thomas Telford in 1801; the spring tides here rise 14 or 15 feet, and the two piers of this harbour appear to offer a safe retreat for ships, secure from every
every wind, and where warehouses are only wanting for the accommodation of a large fleet.

**Itchen River.** Acts 16 and 17 of Cha. II., and 7 and 8 of Geo. III.—The general direction of this navigation is nearly north, for about 14 miles, in Hampshire; it is but little elevated above the sea; its objects are the supply of Winchester with coals, deals, &c. and of Southampton with flour and other agricultural products, and the trade between these towns. At Northam it is joined by the Southampton and Salisbury canal. Southampton is the 68th British town, with a population of 7,913 persons; and Winchester the 103d, with 52,260 persons. It commences in the tide-way in Southampton Water near Southampton, and terminates at Winchester. This navigation is the sole property of James D'Arcy, Esq.; and he and his predecessors were the sole carriers, or nearly so, thereon, until 1795, when commissioners were named, in the above act, for fixing rates of tonnage, on payment of which it is in future to be a free navigation. It was intended to widen the channel between Woodmill and the Roman ditch, and to erect pound-locks where necessary.

**Ivel River.** Act 30 Geo. II.—The direction of this river is nearly south, for about 11 miles, in the county of Bedford; it is not very greatly elevated; its objects are the supply of the towns of Biggleswade, Shefford, and the adjoining country, with coals, deals, &c. and the export of farm produce. It commences in the great Ouse river at Temsford, and terminates at the town of Shefford. On the lower end of this navigation, finances with separate and moveable upright planks instead of gates are in use, as before mentioned. Soon after the passing of the act, the navigation was completed to Biggleswade; but the remainder of the distance to Shefford, 5$\frac{1}{2}$ miles, has not yet been made navigable, for want of money. In the present year (1805) Mr. Benjamin Bevan was employed to survey and estimate the expense of this part, which he states at 7,000l. the river about 26 feet, to be enforced by 5 locks; the toll on this distance is to be 16. 6d. per ton. It is stated that the part of this navigation below Biggleswade has, in the last seven years, produced a net 40cl. per annum, towards the reduction of the debt at first incurred. Several years ago the Biggleswade and Hertford canal was proposed to join this river at Biggleswade.

**Ivelchester and Langport Canal.** Act 35 Geo. III.—The direction of this navigation is nearly east for about 7 miles in the county of Somerset: it is not much elevated; its objects are the import of coals and export of farming products; Langport and Ilchester, or Ivelchester, are considerable towns; it commences in the Parrett below the town of Langport, and terminates at the town of Ilchester, following the course of the Yeo river part of the way, and the remainder by a canal; the company were authorized to raise 8,000l., the amount of shares being 50l. each; half-mile fences are to be erected on this navigation.

**Kennet and Avon Canal.** Acts 24, 25, 26, 41, and 45 of Geo. III.—The general direction of this canal is nearly east for 57$\frac{1}{2}$ miles in the counties of Wiltshire, Wilts, and Berks. The middle part is considerably elevated, and crosses both the western and eastern branches of the grand-ridge, the part between these points, crossing the heads of the valleys which fall to the southern coast, while the ends are in those vales falling to the Bristol Channel and the Thames; its objects are a communication between Bristol, Bath, and London, and the supply of the country west of Hungerford with coals from the mines connected with the Somersetshire Coal canal, which joins at Monkton Combe; at Wiltford it connects with the Dorset and Somerset canal, and at Semington with the Wilts and Berks canal. Bath is the 12th British town, with 32,200 inhabitants; Devizes is the 69th, with 7,650 persons; Bradford the 78th, with 7,320 persons; and Trowbridge the 104th or 105th, with 5,799 persons; Melkham, Hungerford, and Newbury, are also considerable towns on or near this canal. This canal commences in the Avon river at Dole-Mead in Bath, and terminates in the Kennet river a little west of Newbury; the branches that were at first proposed to Calne and Chippenham, have been superceded by the Wilts and Berks canal, and its branches. From the Avon to near Bampton is a mile is a rise of 56$\frac{1}{2}$ feet; thence to Trowle bridge, 10$\frac{1}{2}$ miles is level; thence to Devizes, 54 miles, is a rise of 30$\frac{1}{2}$ feet; thence for 20 miles along the summit-pound (and through the tunnel of 2 miles, at first proposed) to Cricklade; thence to Hungerford is six miles, with a fall of 104 feet; and thence to the Kennet near Reading, 9 miles, is a fall of 72 feet. By the second act, the company were authorized to raise a part of their summit-pound at its eastern end, so as to pass the summit by a moderate deep-cutting instead of the tunnel above mentioned, and to supply the new summit with water by a large steam-engine. This canal is calculated for 50 ton boats; at Trowbridge there is a basin 129 yards long and 60 wide, and another between Lyncombe and Wilcombe. There is a considerable deep-cutting near Burbage: there are two large iron aqueduct bridges over the Avon river, one called Dundas, the other is at Avon-cliff. Provisions were first made in completing parts of this canal at its eastern end, and in October 1798, the same was opened from Reading to Hungerford; in July 1799 the same was opened to Great Bedwin, near the beginning of the summit; in May 1801, the other end of the line was opened from Bath to Devizes. The company were authorized to raise 810,000l. besides a further sum by the last act; the original shares were 120l. each, but a great number of defaulters appeared among the subscribors, (no less than 450 shares it was said) and those remaining being called on for 17l. 14s. 7d. each, made the amount of these old shares 137l. 4s. 7d. each, before the act of 41 Geo. III. that raised the number further to these shares, and created a new set of shares of the amount of 60l. each. The shares of several discontented proprietors were directed to be purchased. This canal passes through Sydney-gardens near Bath, which are laid out and appropriated to pleasurable parties like our Vauxhall gardens. The rates of tonnage are from rd. to 24d. per ton per mile on different goods, and others are fixed for the distance between Bath and Devizes, for which see Phillips's 410. History, Appendix, pages 142 and 143. Mr. John Rennie is the engineer, whose superior skill has been shown in surmounting the great difficulties that have attended the construction of this canal; between Avon-Cliff and Bradford, a single slip coft, it is said, 100cl. repairing. A canal passing through nearly this tract of country was proposed in 1754. The new shares in 1802 bore
bore a premium, notwithstanding no interest is to be received on them until the line is completed, which was required by the Act to be done in the next year, (1806); we sincerely with this may be the case. Some years ago it was proposed to extend a branch of the Basing-stoke canal to join this at Hampstead: in 1796 there was an intention of extending this canal by the side of the Aven to Bristol.

**Kelley Canal.** The general direction of this canal, or water-level, is about E.: originally it was about 1½ mile in length, in the county of Salop; it has a great elevation, being within 7 or 8 miles of the grand ridge on its western side; its objects are the conveyance of coals, iron-ore, and lime-dine, the export of heavy iron goods, &c.; it was contrived by Mr. William Reynolds, and cut in 1785 at the sole expense of Messrs. William Reynolds and Co. and in the year 1791, 1 mile and 188 yards of this level at its cut end were sold to the Shrewsbury company, and made part of their canal; the price was 8½d. half the original cost, with the condition that Messrs. Reynolds and Co. should pay 2d. per ton per mile for their goods passing on the Shrewsbury Canal. This canal now, therefore, consists of about three furlongs of level connecting with the Shrewsbury Canal, at the head of the Wom bridge inclined-plane, and having at its other extremity an inclined plane of 7¾ feet perpendicular fall to the Kelley iron-works; this inclined plane was the first that was brought into practice in England for the passage of boats, and in 1780 a copper medal or half-penny was struck to commemorate the same. The boats used here on are 20 feet long, 61 feet wide, and 3 feet 10 inches deep, carrying 8 tons; they are floated into a shallow lock at the top of the plane in order to place them upon the wheeled carriage or cradle, which carries them down the plane, after the water in the lock is drawn off into a side-pond, to be pumped up again by a steam-engine into the upper pond, and by which no water is lost out of the upper pond or water level. The inclined plane is double, and a descending loaded boat draws up an empty one or but about one-third laden, by means of strong ropes winding round a barrel at the head of the plane, the velocity being regulated by a brake-wheel; of this plane we have before spoken. Several of these small boats linked together are towed along the level by one horse, and to guide them round the projecting turns of the bank, slide-rails are placed thereon.

**Keyingham Level.** In the year 1802, Mr. William Chapman made a survey for a navigation, and drainage-cuts, from the Humber river at Stony-creek, to Roosebridge and Ovingwick: a gate, in the East Riding of Yorkshire, the estimated expense thereof being 150£.; the canal was proposed to pass near the town of Keyingham, its objects being the import of coals, &c. and the export of agricultural articles.

**Kidwelly Canal.** The length of this canal is about 3½ miles, in Caermarthenshire, in South Wales, it is the private property of Mr. Keynam: it extends from the tide-way at the town of Kidwelly to Mancha coal and lime-works, belonging to Mr. Keynam, through whose estate the canal is also cut: its object is the export of coals and lime-works.

**Lagan Navigation, (Ireland).** This is one of the navigations which the Irish parliament have affixed with sums of money, with the view of facilitating the working of the collieries with which it connects; for this navigation and its collieries, various sums of public money were advanced between 1753 and 1779, amounting to 40,504.

**Lancaster Canal.** Acts 32, 33, 30 and 40 of Geo. III.—The general direction of this canal is nearly S. for 7½ miles, in the counties of Westmoreland and Lancaster; the greater part of its northern end skirts along near the sea-coast, but the southern end is considerably elevated, crossing within two miles of its termination the Haddington and Liverpool branch from the grand-ridge. Its objects are the interchange of the lime-dine of the northern parts, for the coals and canal of the southern parts of the line, the supply of Lancaster and Preston, &c.; it is to connect with the sea at Gladstone Dock by a cut of 4 miles from Galgate on the line of the canal; it crosses the Lune and Ribble rivers, but without connecting with them, and it likewise passes under the Leeds and Liverpool canal. Preston is the 37th British town with 13,857 inhabitants, Wigan is the 42d, with 10,930 persons, Lancaster the 50th, with 9,000 persons, and Kendal is the 88th, with 6,952 persons; Burton, Garstang, Kirkham, and Chorley are also considerable towns on this line. This canal commences in a basin at Kirkby-Kendal, and terminates in another at Well Houghton; to Wharton-Craggs lime-works there is to be a cut of 2½ miles, and another of 2½ miles to Duxbury near Chorley. From the basin at Kendal to Greenhead farm (through the Hincaster or Leven tunnel) is 5½ miles and level; thence to near Borwick, (near the Wharton branch) 1½ miles, is a fall of 65 feet; thence to the south side of the meadows south of Preston is 42½ miles and level; thence to Clayton Green 34½ miles is a rise of 222 feet, and thence to Well Houghton 15½ miles is level; the Wharton and Duxbury cuts are level. This canal is 7 feet deep, the boats are 66 feet long and 14 feet wide, carrying 60 tons; and the Gladston branch has a fall of about 52 feet. There are two tunnels, one at Hincaster near Leven’s Park of about 800 yards long, and another through the Whittle Hills near Chorley, which proved a most difficult one to execute; at Ashton near Lancaster there is an amazing piece of deep-cutting. At Lancaster there is no most surprising aqueduct bridge 51 feet high, over the Lune river, confiding of 5 arches of 70 feet span each. (See our article Bridge.) There are other aqueducts over the Ribble at Preston, the Wyre at Garstang, the Bebbo near Bethorn, &c.; and it is passed on an aqueduct 60 feet high near Bark-mill not far from Wigan by the Leeds and Liverpool Canal. At Kendal the canal is supplied with water by a feeder of 1 mile in length from the river Mint: water from all mines within 200 yards may be taken. The part of the line between Wheelton (near to Clayton Green) and the south end of the long level is at present supplied with a rail way, but we believe only as a temporary measure. Mr. James Brindley was employed in 1772 to survey a part of this line, the whole of the town was then after surveyed by Mr. Robert Whitworth, and in 1781 Mr. John Norris was employed, who has had the direction of the works upon it, which will redound to his lasting credit. The company is authorized to raise 1,414,000l. in 100l. shares, and 200,000l. more in shares of 20l. each. In July 1796, the last arch of the Lancaster aqueduct was completed: in September 1807, it was dated that the shares divided 1l. per cent. From Bolton to Lancaster and thence to Preston it was opened in November 1757, and in a few years after the whole of the long level was completed. In June 1803, the Whittle tunnel was completed, and 3½ miles of the rail-way, so that coals passed from West Houghton to Bramer-bridge, and in 1805, the remainder of the rail-way was opened for conveying coals to Preston, Lancaster, &c. At Helton this canal passes along close to the sea beach. The rates of tonnage are, for coals 1d. per ton per mile; for lime-dine, slate, salt, bricks, stone, iron-ore, gravel, sand, clay, and manures ½d. per ton per mile; for lime and iron 1d. per ton per mile, and for timber, wares, and merchandise, 2d. per ton per mile. Coals are not to pass the intended locks N. of Chorley under 25. 3d. per ton, which is to pass them for 18 miles N. of Chorley. It is provided in the
the Lark River. This river (sometimes called the Molden-
hal1) has its source nearly S. E. for about 22 miles in
the county of Suffolk, after skirt ing the bounds of Cambridge
for some miles. Bury St. Edmunds is the 7th Brit ish town,
with a population of 7,572 persons; Moldenhall is also a
considerable town on the line of this navigation, which
commences in the great Ouse river at Prick-willow, (about
43 miles below Ely) and terminates at Bury St. Edmunds.
Its objects are the import of coal, deals, &c. and the export
of farming products. The lower part of its course is em-
banked on both sides through the fields. It is generally very
short of water in the autumn. In 1759, this river was pro-
posed to be crossed by the Bishopsford and Wilton intended
canal; and in 1822 it was proposed to be joined by Bury
St. Edmunds by the Stowmarket and Bury rail-way.

Lea River. Acts 12 Geo. II. and 7, 19, and 45 of
Geo. III.—The general direction of this river is almost north
for about 28 miles, between the counties of Middlesex and
Essex and in Hertfordshire; it is not much elevated. Its
objects are the supply of Hertford and all the surrounding
country with coal, deals, &c. and the export of farming
products, of which most from Ware forms a considerable
part. At Bromley near Bow it connects with the Limehouse
canal, and near Hoddesdon it is joined by the Start river.
Hertford, Ware, Hoddesdon, Waltham-Abbey, Enfield,
and Stratford are considerable towns on or near this naviga-
tion. It commences in the Thames river at Bow-Creek
near the Essex-India Docks, and terminates in the town of
Hertford. It has a short cut to the town of Waltham-Abbey.
This river, which seems subject to floods, was originally made
navigable in some places by weirs and fluff-fluc ces, or turn-
pikes. In 1757, Mr. John Sweaton calculated one of these
flumes to let down 142 1/2 cubic feet of water per minute on
an average, a consumption which greatly injured the mills;
the early pound-locks erected on this river were without
walled chambers. In 1771 some of the turnpikes were
removed and locks built; in 1781, Mr. Sweaton was again
called in to give an opinion on the very leaky state of the locks.
In 1772, and again in 1802, this river was proposed to be
joined at Waltham-Abbey by the London and Waltham-Abbey,
with another junction therewith at Leebridge; and in 1785,
it was proposed to be joined at Hertford by the Leicest er
and London canal. Several years ago the Biggleswade and Hertford
canal was proposed to join this river at Hertford. Between
Hertford and Ware, the New River or aqueduct for the sup-
ply of London, has its rise, partly out of the chalk hills, and
partly by a feeder out of this river, and purifies its devious
course for near 40 miles. This great work was begun by Sir
Hugh Middleton in 1676; in 1773, Mr. James Sharp suggested
the making of the New River navigable, and continuing it by
a level cut to the Thames near Reading. In 1805, Mr. John
Reynolds was employed by government to survey the lower part
of the course of the Lea river, and to construct embankments
across, for filling this extensive vale with water in case of an
invasion: the gates intended to produce these effects, are ve-
"vels that can on the short notice be floated to and sunk
"n their proper places, to flop the water, as before described.

Leatherhead and Thames Rail-way. In 1801, it was pro-
posed to make a rail-way from a bawon to be made on the
banks of the Thames, in West Moulsey (opposite Sunbury)
to the town of Leatherhead in Surrey, through the parishes
of Walton, Cobham, Stoke-Dawbernon, Little Bookham,
Great Bookham and Tetcham.

Lee River, (Ireland.) For improving the navigation
of this river, the Irish parliament between 1753 and 1772,
granted 2,000l. of the public mone-

Lancashire and Liverpool Canal Acts 10, 23, 30, and
31 of Geo. III. The general direction of this canal is be-
tween N. E. and E. by a very crooked course of 179 miles
in the counties of Lancashire and York; it crosses the grand-
ridge by a tunnel, near Colne, and at Red-Moss and Afpule
crosses the Hastingsden and Liverpool branch of the grand-
ridge. Its objects are a communication between the ports of Liverpool and Hull, the export of the immense
floors of coal, canal, and lime-flows, that are found on
parts of its course, and the supply of the great towns thereon
with the agricultural products of the intermediate country.
At Brier's mill it connects with the Douglas navigation (now
belonging to this company, by a purchase under 23 Geo.
III.); near Birk-mill not far from Wigan it crosses the Lan-
caster canal (but is 60 feet above it on an aqueduct bridge.)

At Church it connects with the Hastingsden canal, at Skipton
with the Teami's canal, and at Windhill with the Bradford
canal. Liverpool is the 4th British town with 77,673 inhabi-
tants; Leeds is the 8th, with 53,163 persons; Blackburn is the
17th, with 11,960 persons; Wigan is the 42d, with 10,980;
Bradford is the 95th, with 6,931 persons, and Hulnket the
104th 105th, with 7,999 persons; Ormskirk, Chorley, Burn-
ley, Colne, and Skipton are also considerable towns on or near
this line, which commences in the town of Liverpool on
the bank of the Mersey, but does not connect therewith,
and terminates in the Ayr and Calder navigation in the town
of Leeds; there is a cut to lighten-hill collieries, another
to Mr. Walton's Altham collieries; and provision is made
for cuts to be made by the earl of Bercrares and Mr. Shuttle-
worth between their coak-works and the line. The old ba-
fon at Liverpool is 52 feet above low-water mark in the
Mersey river, from thence to Newborough, 28 miles, is level;
then to the beginning of the diminution that was laid made
in the line, near to the town of Wigan, 7 miles, is a rise of
30 feet, by 5 locks, (this last length being sometimes called
the Upper Douglas navigation, of which it formerly was a
part), thence to Bradshaw-hill near Afspule 3 miles, has a
rise of 279 feet, by 28 locks, (the Lancaster canal being cro-
osed in this distance) thence to the aqueduct over the Der-
went near Blackburn, 15 miles, is level; thence to Grimsbaw
near Blackburn, 2 miles, a rife of 54 feet, by 7 locks;
thence to the end of the diminution at Barrowford near Colne
is 24 miles and level; and thence to the beginning of the
summit pound near Colne is 3/4 of a mile with a rise of 67 3/4
feet, by 7 locks. The summit-pound, passing through the
Foulbridge tunnel, extends to near Thornton, about 62 miles
and level; thence to Holme-bridge near Gargrave is about
7 1/2 miles, with about 150 feet fall, by 15 locks;
thence to Gawthrop-hall near Bingley is 17 miles and
level; thence to the junction of the Bradford
canal is about 4 miles and 100 feet fall by 11 locks;
and thence to the Ayr and Calder navigation at Leeds is about
12 1/2 miles, and 160 feet fall, by 18 locks: the whole lockage
being 844 feet by 91 locks, which are each 70 feet in
length, and 15 feet in width; the breadth of the canal at
top is 42 feet, and it is 44 feet deep in water. The boats
are keel-bottomed, and carry 30 tons of goods, with which
they can go down the Ayr and Ouse as far as Selby; between
Leeds and Wigan, 100 flats of 42 tons but then are em-
ployed in the coal and canal trade, paffage-boats also ploy
regularly on this part. At Leeds there is a fine bawon, and
there are spacious warehouses belonging to this company at
the north-east corner of Liverpool town, and it was intended
in 1801, to connect a new bawon from the North Graving-
Dock on this canal, to the top of Plume street, for which
7000
7,000 cubic yards of earth were to be excavated, and the whole to be lined by 1,200 cubic yards of stone masonry. The coals are thrown out of the boats on a branch that proceeds near to the Mersey, and flie down a steep bank to a yard by the water side. At Foulridge there is a tunnel of 1000 yards in length, and 23 yards below the highest point of the hill; the soil which proved very loose, of the 7,000 yards could be worked under ground, the remainder was obliged to be opened from above, from 10 to 20 yards deep, and 20 to 30 yards wide at the top, although it was supported with immense labour and expense by timbers to prevent its falling, until the tunnel arch was formed, which is 18 feet high and 17 feet wide; it is arched with stone. At Furnby near Burnley, there is another tunnel. At Cottingley below Bingley, and near Gargrave there are considerable aqueduct bridges over the Ayrse river, and several feeder ones in different places. Mr. Longbottom made a survey for this canal in 1767, which was revised by Mr. James Brindley in 1768, under whom the canal was begun, after which Mr. Robert Whitworth and Mr. Fletcher were employed thereon. In 1770, the eastern end of the line was completed from Leeds to Holme-bridge, a distance of 873 miles; at the end of 1794 this was extended to near Foulridge. May 1, 1796, the Foulbridge tunnel was completed and the line opened to Burnley. In May 1801, the Furnby tunnel was finished, and the navigation extended to Enfield within 4 1/2 miles of Blackburn; and in July 1801, the Altham branch was opened. The western end of the line was begun as early as the other, and in 1770 the canal was opened from Liverpool to the Douglas old navigation at Newborogh, 28 miles; and on 19th October 1774, the present navigation was completed to Wigan. This company was authorized to raise 500,000l. the amount of shares 100l. The rates of tonnage are, on lime- and stone other stones 1s. 6d. per ton per mile, on coals and lime 1d. and on all other articles 1 1/2d. per ton per mile. No wharfage is to be taken unless goods remain 6 hours. In September 1805, the company proposed lowering their rates of tonnage on the Douglas lower navigation. About the year 1764, a branch of the Manchester Bolton and Bury was proposed to join this canal. Red-Mals near Wigan, 1830, were proposed to make a branch from this canal near Wigan to Bridge-water's canal at Pennington; also a branch or railway from it to Lowhall colliery.

Leicestershire Navigation. Acts 31, 34, (for Abbey Canal) and 35 of Geo. III.—The general direction of the line of this navigation is about south, following nearly the course of the Sear river, for 14 miles in the county of Leicesters, its Charnwood Forest branch is considerably elevated. Its objects are the supply of Leicesters with coals, deals, and general merchandise, the export of coals and limestone from the mines on its branches, and the farming products of the country. On the completion of the Leicesters Union canal it will become a considerable thoroughfare. At Turn-water Meadow in Coftington, it is joined by the Leicesters and Melton-Mowbray navigation. Leicesters is the 32d British town with a population of 16,953 persons; Loughborough and Mountsorrel are also considerable towns on the line. It commences in the basin of the Loughborough navigation at that town, and terminates in the Leicestershire and Northamptonshire Union canal, at Leicesters. From the basin at Loughborough, a railway branch of 2 1/2 miles, and a rise of 185 feet, extends outwards to a basin at Forrest-lane, at the east end of the Charnwood Forest water-level, which level extends 5 1/2 miles to near Barrow-hill, having a rise of 1/2 of a mile to Thringstone-bridge, and level. From the west end of the water-level a railway extends 1/2 of a mile further to Clouds-hill line-works, and there connects or very nearly to with a branch of the Abbey de-la-Zouch canal; there is a short railway branch of six chains to Barrow-hill line-works; the Thringstone bridge branch is also continued by a railway to Coal-Orton in two branches of 1 1/2 mile, and another of 1/2 of a mile to Swannington-common coal-works. From Loughborough station to the junction of the Leicesters and Melton-Mowbray navigation it is 4 miles, and level, and thence to the Leicestershire and Northamptonshire Union the distance is 11 miles, with a rise of 45 feet. On Charnwood Forest there is a railway for supplying the water-level, and a feeder of 1 1/2 miles in length to convey the water to it. Near the well bridge in Leicesters there is a basin for the use of this navigation. Mr. William Jeffry was the engineer; in December 1792 the part of the line between Loughborough and Siclby, near Mount Sorrel, was opened, and in February 1794 the remainder of the same to Leicesters was opened. The company was authorized to raise 84,000l. The rates of tonnage are various: see Philips's 4to History, Appendix, p. 12. On the making of the Abbey canal, with branches to the neighbourhood of the collieries connected with the Charnwood level, the company were allowed 2s. 6d. per ton on all coals dug in Swannington, Coal-Orton, or Thringstone parishes, and carried through Blackfordby, on the Abbey canal. The company are authorized to make railways to any mines within 2000 yards of the water-level, and are to guarantee the Loughborough company a receipt of 2000l. per annum, on condition of their taking 1s. 6d. or less per ton (but not less than 10d.) for coals passing from Loughborough to the Trent river.

Leicesters and London Canal. About the year 1792 printed proposals and a plan were circulated, for a canal from the Leicesters navigation at that town to the Lea river at Hertford, a distance of 77 miles; passing Market-Harborough, crossing the Nene river at Wellingborough, and connecting with the Ouse navigation at Bedford; its proposed object, as a rival to the Grand Junction, was the forming of the shortest communication between London, Liverpool, Hull, and Lynn, and the intermediate large trading towns, mines, &c.

Leicesters and Melton-Mowbray Navigation. Acts 37 and 40 Geo. III.—The general direction of this navigation is nearly E. following the courses of the Wreak and Eves rivers, for about 12 miles, in the county of Leicesters; it is not greatly elevated in any part, its objects are the supply of Melton-Mowbray with coals, deals, &c. and the export of the farming products of the country. It commences in the Leicesters navigation at Turn-water Meadow in Coftington, and terminates in the Oakham canal, at the town of Melton-Mowbray. The company were authorized to raise 45,000l. The original rates of tonnage may be seen in Philips's 4to History, Appendix, p. 13, but these were altered and increased by the late act above, and several regulations made respecting tolls with the Oakham company. This navigation was completed in a few years after the passing of the first act.

Leicestershire and Northamptonshire Union Canal. Acts 33 and 45 Geo. III.—The general direction of this canal is nearly E. by a crooked course of 43 miles in the counties of Leicesters and Northampton; its middle part is considerably elevated, and skirts along the eastern side and near to the grand-ridge for several miles: its objects are the formation of a junction between London, Hull, and Lynn; the supply of the country through which it passes with coals, deals, &c. and the export of farming products; it is to connect at Northampton with a railway branch of the Grand Junction. Leicesters is the 32d British town, with a population of 16,953 persons, and Northampton is the 85th, with 7,020 persons, Market-Harborough
is also a considerable place near the line. This canal commences in the Leicester navigation in the town of Leicester, and terminates in the New river at Northampton; there is a cut of 5$\frac{3}{4}$ miles in length to Market-Harborough. From the Leicester navigation to Fleckney near the Saddington tunnel is 12$\frac{3}{4}$ miles, with 100 feet rise; thence to Great Oxenden 131 miles are level; thence in $\frac{1}{2}$ of a mile is 50 feet rise; thence the summit-pound extends through Oxenden and Kelmehar tunnels to near Maidwell, 4$\frac{1}{2}$ miles and level; thence to the junction of the North river near Northampton are 112 miles, with a fall of 197$\frac{1}{2}$ feet, and thence to the head of the New navigation is 2$\frac{1}{2}$ of a mile and level. The Market-Harborough cut is level. At Gunley there are a bason and warehouse. There are four tunnels on this line, viz. at Foxton, of 1956 yards in length; at Kelmehar, of 509 yards in length; at Saddington, of 880 yards in length, and at Oxenden, of 286 yards in length. On Oxenden and Kelmehar brooks are the aqueducts for the supply over the summit-level, but flood-waters alone are to be taken. There are a great number of small aqueducts over the streams which it passes. Mr. John Farley, fea, and Mr. C. Stanles, jun. are the engineers. In March 1800, the tunnel at Saddington was finished, and the line opened from Leicester to Gunley, a distance of 17 miles; but small progress appears to have been made with the other three tunnels, and the remainder of the line, intended to form the union. The rates of tonnage on coals and coak are 2$\frac{1}{2}$d. per ton, per mile, but not to exceed 5$p$. for any distance; for lime, lime-flone, dung, and manure 1$d$. per ton, per mile, but not exceeding 28$\frac{3}{4}$d. per ton, on any distance; for live cattle, felines, bricks, tiles, flates, land, iron-flone, pig-iron, and pig-lead, 2d. per ton, per mile, and for other goods 3d. per ton, per mile; troops and government stores are exempted. Road-materials, and manures (except lime) for the use of the proprietors of lands on the ponds, may also pass the locks when the water runs wafte thereat. The towing path may be used as a bridle and drift-way by the owners of adjoining lands. By the first act the company were authorized to raise 300,000l. shares 100l. each; the last act was for varying some parts of the line and amending the former one. About the year 1793, the Upningham canal was in contemplation, and its junction with this canal is provided for in the first act above. In 1803 it was proposed to alter and shorten the branch to Market-Harborough, and to make a feeder from Willow brook; and in the same year Mr. Thomas Telford surveyed the line of country between Gunley bason and Buckby wharf on the Grand Junction canal, proposed as a substitute for the southern part of the line to Northampton.

**Leominster Canal.** Acts 31 and 36 Geo. III.—The general direction of this canal is nearly W. by a crooked course of 45$\frac{3}{4}$ miles, in the counties of Worcester, Salop, and Hereford; its west end is very considerably elevated; its objects are the supply of Leominster and the country with coals from the Pinfax mines near its easterm end, and the export of iron, lime, and agricultural products: Kingston, Prettigne, Leominster, Ludlow, Tenbury, Cleobury-Mortimer, and Bewdley are considerable towns on or near to the line of this canal: it commences in the Severn river at Areylcy near Stour-port, and terminates at the town of Kingston: it has two short cuts to mills near Tenbury. From the Severn river to the exit end of the Pinfax tunnel it is 3 miles, with a rife of 207 feet; thence through that tunnel, and the Soufmat tunnel to its western end, it is 9 miles and level; thence to the river Rea aqueduct is 1 mile, with a fall of 30 feet; thence to Letwiche brook, 7 miles, it is level; thence to Wilton, 4$\frac{1}{2}$ miles, is a rife of 36 feet; thence to near Ludlton, 5$\frac{1}{4}$ miles, is level; thence to Leominster, 1$\frac{1}{2}$ mile, is a fall of 18 feet; thence to near Kingland are 4$\frac{3}{4}$ miles, with 63 feet rife; thence to Milton are 3$\frac{1}{2}$ miles, with 37 feet rife; thence to Stanso-park are 2$\frac{3}{4}$ miles, with a rife of 152 feet, and thence to Kington are 4 miles, and level. At Pinfax is a tunnel of 3850 yards, and the other at Soufmat is 1250 yards in length. There are considerable aqueduct-bridges over the Rea river at Knighton, over the Teme at Woferton, and over the Lugg at Kingland: a power is provided in the act for inclined-places instead of locks, if the same should be found molt eligible; springs of water within 2000 yards of the line may be taken. Mr. Thomas Telford, jun. is the engineer. In July 1795 the difficult tunnel at Pinal-field in Soufmat was finished, and in November 1795, near 20 miles of canal, from Mamble coal-works to the town of Leominster were opened, and coals, which before sold there at 1s. 6d. per cwt., were at once reduced to 9d. per cwt. ! On the 1st of June 1797, the entrance of the canal from the Severn was opened: since which considerable progress has been made in the works: in May last (1805,) the Pinfax mining company was proposed, for opening new coal and iron mines near that place, on the line of the canal, which was expected to facilitate its completion. The Leominster company have been authorized to raise 370,000l. The tonnage rates are too long for our room, they will be found in Phillips's topo. History, Appendix, p. 5 and 6. About the year 1794, the Westpool and Leominster canal was proposed to join this at Woferton.

**Liffey River, (Ireland).** The direction of this river is nearly weft, in Dublin county, from the bay of Dublin to the entrance bason of the Grand Canal in Dublin city, where also are a Harbour and Docks that have been improved, under Mr. William Telford; the spring tides rife only 15 feet at these dock-gates. In the year 1800 it was proposed to avoid the bar at the mouth of the Liffey, by cutting a new channel or canal for ships from Dnleary to Kingland dock; it was also proposed to make Dalkey a safe harbour, and to make a cut from thence to the Grand Canal bason; the bill for this purpose was passed by the commons, but was rejected by the house of lords. Ormond bridge, on this river, was carried away by a flood, and in September last (1805,) the corporation of Dublin harbour offered premiums for the best plans for a new bridge at this place.

**Limehouse Canal.** The direction of this canal is about N.E. for 1$\frac{1}{4}$ mile, in the county of Middlesex; it is but little elevated above the level of the sea; its object is to connect the river Lea with the river Lea, and the port of London, by avoiding the circuit round the Isle of Dogs; it commences in the river Thames near Limehouse church, and terminates in the Lea river at Bromley near Bow, having a rife of 1$\frac{3}{4}$ feet. This canal was cut at the expence of the city of London, in an early part of the present reign, and its locks, which are of wood, and its other works, form a great contrat to the improved locks and appendages of modern canals. In 1773 a cut from the intended London and Walton-Abbey canal was intended to join this near Limehouse church.

**Limerick Canal, (Ireland).** This canal was cut near 40 years ago from the town of Leitrin to a morass within a short distance, for the purpose of bringing turfs, to supply the town of Limerick with fuel, and which by their cheapness superceded in a great measure the use of coals, which coming by a long coast-ways navigation were very dear.

**Liffard Canal.** In 1777, Mr. Edmund Leach proposed a canal, or rather a systen of water-levels and inclined-planes, from the tide-way in the Luce river, at Sand-place in Morval to Bark-mill-bridge, in St. Clear; this was proposed to be accomplished by two levels of 9 and 6 miles in length.
Length, (one of which, in its serpentine course, went within ½ a mile of Lillie-card town,) connected with each other and the river below by two inclined planes for boats, the principles of which have been already explained; the estimate was 17,500l. The objects of this navigation were the carrying up of lime and sea-fand for manure, and exporting corn, &c.

Liverpool and Runcorn. About the year 1771, a survey was made by Mr. James Brindley, for a canal from the town of Liverpool upon one level, to cross the Mersey at Runcorn-gap, by an aqueduct bridge, and join the duke of Bridgewater’s canal; before the great width of the Mersey at this place, a tide, which rises 14 feet, was also to be encountered.

Llandovery and Llandy. In September 1821, notices were given for an intended canal from Spitty in the parish of Llanelli, on the Burr river, through Llange-neu, Llandy, Llandybe, Llandidlo, &c. to Llandovery or Llanyged-dwyi, in the county of Caernarthen in South Wales. The objects of this canal were first accomplished by the Carmarthenshire railway, over nearly the same tract of country.

London Canal. In July 1802, a survey was made for a canal, about in a west direction, for near 7 miles, in the county of Middlesex: commencing in the London docks, (and thereby communicating with the Thames river,) to pass Well's-gardens, the mount in White-chapel road, and Bethnal-green New road, across Hackney road, through Middlesex-place across Kingsland road, near Iron-monger's alms-houses, to pass north of Lady Lumley's alms-houses at Hoxton, across the city road below the turnpike-gate, across Goswell-street, south of Goswell-place, across St. John's-street, north of Taylor's brewhouse, under the field foot of the New-river head, over the valley at Bagnige-wells, across Gray's Inn-lane at the west corner of the Well charity-school, across the New road to the caflle corner of Bedford nurseries, across Tottenham court road between St. James's burying-ground and the New-river referral, pass the fronts of the Artichoke and Queen's-head public houses, and across the Edge-ware road to the basin of the Grand Junction canal at Paddington, the rise in this distance being about 35 feet. The great number of bridges required, the paling of the field near Illington fall of water-pipes in all directions, belonging to the New-river company, by an arch under the same, and a large embankment or aqueduct bridge near Bagnige-wells, were difficulties in the way of this project, but to which the subscription for shares (which almost immediately filled to the amount of 400,000l.) would have been equal; had not the inability of the Grand Junction company to furnish the water necessary for the lockage, and the opposition of several powerful land owners, on account of its making some alterations necessary in their building projects, frustrated the scheme altogether for the present. The western branch of the Grand Junction, of which we have before spoken, was in contemplation at the time this canal was intended, and water was proposed to be obtained thereby from the Thames for this canal, the Colne millers having it unfortunately in their power, to prevent any being obtained from that river; Mr. John Rennie, who gauged the stream of the Thames, in the dry summer of 1794, at Leakeham (which is after it has received the main streams of the Colne,) found 1153 cubic feet of water to pass in one second of time, which is 134 times what would be required to be taken from this river higher up near Great Marlow, and brought by the Grand Junction level branches, for supplying the lockage of this canal, supposing 60 locks containing 1055 cubic feet each, to be used daily. After the opposing interests were found too strong to leave any prospect of carrying this canal, a faint effort was made to accomplish a rail-way, through nearly the same line, but with no better success. In 1773, Mr. Robert Whitworth made a survey for the city of London, and recommended a line of canal from the Lee river at Lee-bridge, to near the same spot which the Grand Junction basin now occupies at Paddington: it was intended as branches call and well of the London and Waltham-Abbe canal.

London Lynn and Norwich. In the year 1785, Mr. John Philips published a thin 4to. treatise, to endeavour to call the public attention to a canal between the Ouse river at the port of Lynn, and the Thames river at Limehouse in London, with a branch to the Tare river at Norwich. It appears that Mr. P. travelled through the proposed tract of country in 1779 and 1780, but took no levels or other necessary particulars, yet ventures to state, that he could execute this canal, 36 feet wide, and 4½ feet deep, for 200,000l. And it is held out, that 28,000 oak Trees, to be planted on the banks of this canal, will, in 50 years, repay all its expenses within 60,000l. In 1803 we are told that Mr. Ralph Dodd made an effort to revive this or a similar scheme, and wished to denominate it the North London Canal.

London and Waltham-Abbe. In the year 1773, at the instance of Mr. James Sharp, Mr. Robert Whitworth was employed by the city of London to survey the line for a canal between the centre of the quarters in Moorfields, London, to the river Lea at Waltham-Abbe; a distance of 14 miles, almost in a north direction in the counties of Middlesex and Hertford; this line was to be level (and about 30 feet above spring-tides in the Thames,) there was a cut of ⅓ of a mile, and 33 feet fall proposed to the Lea river at Lee bridge, and another of 4½ miles to Wellin's farm near Paddington, with 495 feet rise; nearly to the same level as the Grand Junction basin now has; also another cut of near 2 miles to the Limehouse canal near the church, with a fall of 42 feet (to the common ncp tides in the Thames.) The width was to be 60 feet, and depth 4½ feet; in Moorfields and near Holywell Mount, large basins were intended; between Stamford-hill and High-crofs a very large embankment was proposed, another at Hackney brook, and another at St. Pancras brook; at Ponder's end was to be a deep-cut to avoid the houses; 15 turnpike-road-bridges, and 22 road-bridges of lesser size were necessary, the whole expense Mr. Whitworth estimated to be 98,225l. In 1803, this or a similar scheme seems to have been in contemplation, but to join the Thames near Bell-wharf in Shadwell instead of the Limehouse cut.

Loose River. The general direction of this navigation is nearly N. for about 34 miles, on the south coast of Cornwall, it commences at the sea near East Loose, (which is a considerable town,) and terminates at Morval bridge, near which, at Sand-place, it was, in 1777, proposed to be joined by the Lifeboat canal; its objects are the carrying up of coal, and sea-fand as manure, and the export of agricultural products.

Loughborough Navigation. Act 16 Geo. III.—The general direction of this navigation is nearly S. for about 9 miles, following the course of the Soar river, except in the last mile, which is a new cut; it is but little elevated; at the basin, 300 yards from its south end, it is joined by the line of the Leicestershire navigation and by the Charnwood-forest railway branch belonging thereto. It commences in the Trent river (nearly opposite to the Erewaugh canal,) and near to the Trent canal near Sawley, and terminates at the Rushes near the town of Loughborough, which is a considerable
confiderable place; its objects are as various as the trade of the Thames, and the wants of Leicifter and other great towns; it forms also part of the line of communication which the Leicifter and Northamptonhire Union canal is to open.

On the making of the Leicifter navigation, that company guaranteed the amount of the tolls on this, to amount to 30,000l. annually, on condition of no more than 16. 6d. per ton on coals or lefs than 10d. being taken by this company.

**Louth Navigation.** The general direction of this navigation is nearly S.W. for 14 miles in the county of Lincoln, it is but little elevated above the sea; its objects are the supply of Louth, and the adjacent country with coals, deals, &c. and the export of farming produce; it commences at the fea-lock and cbb-gates in Tintey Haven (at the mouth of the Humber river), and terrimates at the town of Louth. From Tintey Haven to the Louth river near North Cockerington 92 miles is level, and but little higher than low-water mark, being a new cut through a low fenney country; thence to Kiddington old mill, 22 miles, is 24 feet rife; thence to the Leather-mill meadow, 2 1/2 of a mile, 11 feet rife; thence to Louth is 3 1/2 of a mile with 21 feet rife. Mr. John Grundy made a survey of this line, which was revised by Mr. John Swaton, in 1760, the estimate of expence being near 15,000l.

See Swaton's Reports, vol. i. p. 23.

**Lynn River.** The general direction of this river (sometimes called the Lune) is nearly N.E. for about 7 miles in the county of Lancaster; the tide flows through its whole length; its object is the foreign trade of Lancaster, particularly in cabinet-maker's wares, a branch of the Lancaster canal is to connect with it at Glasson, where a spacious wet-dock is intended. Lancaster is the 50th British town with 9,030 inhabitants; this river commences in the Irish sea at Sunderland point, and terrimates at Lancaster old bridge, some distance below Mr. Rennie's famous aqueduct bridge over this river. It appears, that in the year 1790, 52 vessels cleared out of this river for the West Indies with 11,669 tons of goods in more than 90,000 packages, worth 2,5 millions sterling. In October 1790, it was in contemplation, to construct a spacious dock at Thornbury for large ships, with a canal from thence of 6 miles in length through Glasson-dock, and nearly up to the town of Lancaster, to be wide and deep enough for the largest vessels that trade to that place.

**Lynn River.** The general direction of this river (sometimes called the Lenne, the Nar, or the Seeby) is nearly S.E. by a crooked course of about 15 miles in the county of Norfolk; it is not greatly elevated in any part; its objects are the import of coals, deals, &c. and the export of farming produce; Lynn is the 50th British town with a population of 10,096 persons, Narford is also a considerable town; it commences in the Great Ouse river near the harbour of Lynn, and terrimates at the town of Narford.

**Macclesfield and Leek.** In 1796, it was said, that a canal between these places was in contemplation, with extensions thereof to the Staffordshire potteries, in all 20 miles, on which no locks were to be used. Macclesfield is the 61st British town with 8,733 inhabitants.

**Maidenhead and Islworth.** In the year 1770, Meffrs. James Britto and Robert Whitworth, were employed by the city of London, to survey the line of a canal from the Thames river at Islworth, to the same river again below Bolter's-lock near Taplow-mill, about 1 mile above Maidenhead-bridge, and at the lower end or termination of the 3d district of the Thames and Isis navigation; the length of this line is 193 miles with a rife of 7 1/4 feet. The canal was proposed to be 50 feet wide and 4 deep, with cuts to the Thames at Windfor, and near Lakeham; in the first 5 miles 7 locks were to be built, and one in the remaining distance; the estimate of expence was 47,953l. A bill for this was brought into parliament, but the opposition of the land-owners proved fatal to it; although, as appears, by an accurate measurement and section of the river between these two points made by the above engineers (see Gentleman's Magazine for March 1771), that the length of the river-navigation is 372 miles in this distance, and greatly obstructed by shallows, some only 24 feet deep in dry leafons. In the year 1791, this scheme was revived, and in 1764, Meffrs. Robert Whitworth and Robert Mylne were employed to revife this line; their design has 12 miles of level at the upper end, and 10 of them raight; the canal to be 5 feet deep. The tolls at first proposed were 3 6d. per ton per mile on all articles; out of this revenue, it was proposed to improve the river navigation between Mortlake and Bolter's-lock; and to raife the necessary fums on life annuities, fo that after a fund was established for repairs and management, the canal might at length become free for the public use. At Bolter's lock the Reading and Maidenhead canal was proposed to join this canal, by which the navigation from London weftward would have been amazons shortened and improved.

**Manchester Ashton and Oldham Canal.** Acts 32, 34, 38, 40, and 45 of Geo. III.—The general direction of this canal is nearly E. for about 7 miles in the counties of Lancafier and Cheshire; its eastern end is considerably elevated; its objects are the supply of Manchester and Stockport with coals, canal, flone, lime, &c. and forming part of the intended direct communication between Liverpool, Manchester, and Hull, by means of the Huddersfield and other canals; by means of its Duckenfield branch it communicates with the Peak Forest canal. Manchester is the 2d British town with 84,020 inhabitants, Stockport is the 25th with 14,850 persons, and Oldham the 35th with 12,024 persons, Alhton is also a considerable town, and the country round about is full of inhabitants. This canal begins in the Rochdale canal near Piccadilly street in Manchester, and terrimates in the Huddersfield canal at Duckenfield bridge, in the parish of Alhton underline; from Duckenfield bridge is a branch of 3/4 mile in length, over an aqueduct bridge on the Tame river at Walk-mill, into Duckenfield, there to join the Peak Forest canal. There is a branch of 1 mile to Alhton town, another of 3 1/2 miles to New Mill town, 3 miles of Oldham (but 33 miles distant from the town), from which last at Boodle-wood a branch proceeds over Water-Houfes aqueduct on the Medlock brook, to Park collieries at Stake-Leach near Hollingwood, also in the parish of Oldham; from Droyladden, a branch of 6 miles proceeds to the end of the town of Stockport in Heaton-Norris parish, and from this laft, a branch of 3 miles proceeds in a N.E. direction to Beat-Bank in Denton. The line has a rife of 152 feet between the Rochdale and Huddersfield canals. This canal is 33 feet wide at top, 15 feet at bottom, and 5 feet deep in water, except the summit pound which is made 6 feet deep to act as a refervoir; the locks are 80 feet long, and the boats carry 25 tons; there are three confiderable aqueducts at Duckenfield, Ancoats, and at Water-Houfes. This company were authorized by their first 4 acts to raise 170,000l., and a further fum by the late act; amount of shares 100l. The line of this canal was completed between Manchester and Alhton about the end of the year 1796, and in January 1797, the Stockport branch was opened; some of the works on this canal subsided by a flood in August 1799. The rates of tonnage are given in Phillippo's 4to. History, Appendix, p. 21. In 1802, we were told, that the shares in this concern were 20l. below par.

**Manchester Bolton and Bury Canal.** Acts 31, and
and 41 of Geo. III.—The general direction of this canal is N.W. for about 11 miles in the county of Lancashire; its northern end is considerably elevated; its objects are a communication between the great manufacturing towns of Manchester, Bolton, and Bury, and the carriage of coals and other articles for their supply, and forming part of the line of communication between Manchester and the Leeds and Liverpool canal. Manchester is the 2d British town with 84,020 inhabitants, Bolton is the 32d with 12,592 persons, and Bury the 8th with 7,072 persons. This canal commences in the Mersey and Irlwe navigation near the junction of Medlock brook (by which it communicates with Bridge-water’s canal near the beginning of the Rochdale) at Manchester, and terminates at the town of Bolton; it has a branch of 4 miles in length to the Haffenden canal at the town of Bury. From the Mersey and Irlwe navigation, it is a rife of several locks to the basin in Salford parish; thence for about 4 miles is level; in the next 3 miles are 12 locks, the remainder of the line is level, including the branch to Bury; the whole rife is 187 feet. Previous to 1794, this canal was begun, and several locks were built for narrow boats, but on account of the branches connecting with wide canals which were proposed about that time, these were pulled up and rebuilt, and the canal widened, including some expensive deep-cutting and embanking; a want of skill or care appeared also, we are told, in the setting out of this canal by cutting deep through rocky ground which might have been avoided. There are two aqueduct bridges over the Irwell at Clifton-Hall and near Stocks; and one over the Leven at Long-fold, these are said to be 25, 16, and 10 yards high; the canal was, in 1799, supplied by a feeder from the Irwell at Bury, but in 1802, a reflovoir and feeder also was found necessary in Radcliffe parish. In 1797, this canal was completed to Bolton, except the locks to connect with the Mersey and Irlwe navigation; on the 17th of August, 1799, a great flood happened, which carried away the lower bank of this canal for 100 yards together on the summit-level, and another branch therein also happened, by which the navigation to Bolton, &c. was some time interrupted. This company were authorized by their first act to raise 97,000l, and a further sum by the late act. The rates of tonnage are for coals, lime-flone, flone, bricks, clay, &c. 2d. per ton per mile, if they pass a lock; but all thefe, except lime-flone, are to pass on the levels for 3d. per ton per mile; and when the water runs wafte at the locks, lime-flone is also to pay only 3d. on any part; the tonnage at the entrance of the Mersey and Irlwe navigation is also regulated by the firt act. Passage-boats from Bolton to near Manchester are established; but when water has been scarce, the paffengers have been required to walk paft the locks to another boat on the lower pound to avoid the wafte of lockage-water. About the year 1794, it was in contemplation to make a branch from Bolton, to connect with the Leeds and Liverpool canal at Red Mofs near to Wigan, and to make a grand extension of the Bury branch eastward to the Calder and Hebble navigation at Sowerby-bridge, paffing the grand-ridge between Littleborough and Rippondale by a tunnel of 3 miles in length! after paffing a shorter tunnel of 3/4 a mile at lower Lomax near Heyford. In 1796, it was propofed to extend a branch from the basin in Salford parish to Oldfield-Lane in that town; and, in 1799, it was in contemplation to build an aqueduct bridge over the Irwell, and connect this canal with Bridge-water’s canal, instead of lock- ing down into the Mersey and Irlwe navigation.

Market-Weighton Canal. Act 12 Geo. III.—The general direction of this canal is nearly N. for about 11 miles in the Eaft Riding of Yorkshire; it has but little elevation above the sea; its objects are the conveyance of coals, deals, &c. to Market-Weighton and the surrounding country, the export of farming products, and the better drainage of the fen lands through which it passes; it commences in the tide-way in the Humber river (opposite to the Trent river) at Fuldyke-Clough, and terminates near Market-Weighton. It has a sea-lock next the Humber, from whence it is level to within a short distance of its northern end, where it is a rise of 4 or 5 locks. Mr. John Sweton was confulted on this line of canal and drainage, in 1763, at which time a branch of this canal to Pocklington was in contemplation; for the rates of tonnage, fee Phillips’s 40th. History, p. 270. This navigation was completed long after the paffing of the act.

Mawgan Canal. About the year 1775, a narrow canal was cut of 6 or 7 miles in length; from Port Mawgan near Trenance on the N.W. coast of Cornwall, to within 3 miles of St. Columb Major, it was intended for bringing up coals and sea-fand for manure, and for carrying down china-flone and clay, subfiances found in St Dennis and St. Stephens, and used in the Staffordshire potteries; but after several of the adventurers were ruined, the scheme was totally abandoned.

Medina River. The direction of this navigation is south, and nearly straight for 4½ miles, in the Isle of Wight in Hampshire; the tide flows through its whole length; its object is the supply of Newport and the central parts of the island with coals and other articles; it commences at Cowes harbour (opposite Southampton Water), and terminates at Newport bridge.

Medway River (lower district.) Acts 32 and 42 of Geo. III.—The general direction of this navigation is nearly S.W. for about 27 miles by a bending course in the county of Kent; it is but little elevated in any part; its objects are the import of coals, deals, and other articles, and the export of Kentish-Rag lime-flone, fullers-earth, farming-produce, &c. near its northern termination, it connects with the east Swale or tide-way paffage, of about 15 miles in length south of Sheppy island, connecting with the Thames near Whitable; and, at Nicholson’s ship-yard in Strood it is joined by the Thames and Medway canal. Chatham is the 46th British town with a population of 10,505 persons, Maidstone is the 66th with 8,247 persons, and Rochester is the 90th with 6,817 persons, Sheerness, Queenborough, and Milton, are considerable towns on or near this navigation, which commences in the river Thames at the Nore, and terminates in the upper Medway navigation at Maidstone bridge. Over this river at Rochester, there is a flone bridge of 71 arches and 256 feet long. At Chatham is a very considerable naval arsenal. The powers of the above acts for repairing and levying of tolls, extend no further down this river than from Maidstone to the tide-way at Aylesford bridge.

Medway River (upper district.) The general direction of this part of the river is S.W. for about 12 miles in the county of Kent; it is not much elevated in any part; its objects are the import of coals, deals, &c. and export of lime-flone, fullers-earth, farming-produce, &c. besides Maidstone, mentioned above, Tunbridge is the only considerable town on this line; it commences in the lower Medway navigation and terminates at the town of Tunbridge. In 1802, the Medway and Rother canal was proposed to connect with this river at Yalden-lees.

Medway and Rother. In the year 1801, a survey and estimate was made by Mr. Sutherland, for a canal from the Rother river intended navigable branch at Small-Hitch, to the Stour river at Canterbury (at the S. end of the proposed Canterbury and Nicholas-bay canal), with a branch theroof
to the Middleway river at Yalden-lees, through the counties of Suffolk and Kent; its objects were the supply of the interior country with coals and other articles, the export of timber and farming products, and forming a communication between the south coalt at Rye-harbour and the Thames river, &c. Forty-ton boats were intended to be used, and the canal to be 4 feet deep. The summit was found to be about 102 feet above the sea, and nearly 50 miles of the line was to be upon one level.

**Menai Strait.** This freight separates Anglesea ile from North Wales, and has nearly a N.E. direction for about 16 miles, through which the tide flows; it extends from Caernarvon bay at Abermenai Ferry to Lavan Sands; Caernarvon and Bangor are considerable towns on this line. In 1801, and 1802, it was in contemplation to build a cast-iron bridge over this strait at Swelly rocks near Portcathory Ferry not far from Bangor.

**Mersey and Irwell Navigation.** Acts 7 Geo. I. and 34 Geo. III.—The general direction of this navigation is nearly east, by a crooked course of 50 miles in the county of Lancaster, and skirting the county of Chester; the first 20 miles being by a most spacious culvert of the Mersey river; it is not greatly elevated in any part; its objects are most important, particularly in the immense trade between Liverpool and Manchester, and Hull, also by four different routes across the grand-ridge; the navigations immediately connecting therewith are, at Ellesmere-port in Netherpool, where it is joined by the Ellesmere canal; at Woburn by the Waverley river; at Runcorn-Gap, and again at Manchester (by the Medlock Brook), by Bridgewater's canal, besides being crossed thereby on Barton aqueduct; at Tidlers-ferry, and also at Sankey Brook, by the Sankey canal; and at Manchester, near the junction of Medlock Brook, by the Manchester Bolton and Bury canal; besides which, the following commence very near to this navigation, although they do not actually lock down into it: viz. the Leeds and Liverpool, at the basin in Liverpool, the Trent and Mersey, at Preston Brook, and the Rochdale, at Manchester; to which also the Manchester Ashton and Oldham ought to be added, although a very short space of two other navigations must be passed through before you can reach the Irwell therefrom. Manchester is the 2d British town, with a population of 84,020 persons; Liverpool is the 4th, with 77,653 persons; and Warrington is the 45th, with 10,657 persons. This navigation commences in the Irish Sea, at Wallazy, about 3 miles below Liverpool, and terminates at the bridge between Manchester and Salford; but the powers of the act, as to improving the river and collecting the tolls, at first extended no lower than Bank-key, near Warrington, and hence to Runcorn Gap. The winding course of the river has been shortened in several places by side-cuts across the loops, and locks and weirs have been erected in several places, the rise in the whole length being about 70 feet; these rivers are subject to sudden and violent floods, which have at times destroyed several of the navigation works; in August 1864 a new side-cut was completed, for shortening the course of the navigation, and avoiding the shallows in the river; between Warrington and Runcorn Gap it crosses the Sankey canal. The famous wet-docks at Liverpool are an appendage to the Mersey navigation, and are indeed a part of that river, from not being excavated in solid ground, where houses formerly stood, as they did on the site of the London Docks; but all of them, except the old Dock, which was a natural creek or pool, have been formed in the front of the town, by embankments in the river, which is here ¾ of a mile wide. At the lower or northern end of these docks, as we viewed them in 1797, is a large inlet or walled tide-basin, which connects with the river, and is dry at low water, from the S.E. corner of this is the entrance of St. George's Dock, which was the third large dock that was made, and is nearly a parallelogram, of 250 yards long and 100 wide, its quay being 670 yards long, its gates are 25 feet high and 38 feet wide, and it cost about 21,000/. Palling southerly, we next arrive at a dry basin, called the old dock, for the flats to which belonging to the Mersey and Irwell company, which are about 50 in number; and some distance south of this is another large inlet to a spacious dry-basin for ships: from the north end of this basin are other gates into St. George's Dock, above mentioned, and straight forwards in the entrance to the Old Dock, or the first that was built, and is wholly within the town; this dock forms an irregular parallelogram, of 200 yards long and about 80 yards wide, its gates being 23 feet high and 34 feet wide; it is lined with bricks, but all the other dock, basin, and pier walls are of beautiful hewn stone. From the south-call of the last described dry-basin is the entrance to Salt-House Dock, which was the second made, is an irregular trapezium, of 21,028 yards in area, and has 645 yards in length of quay, its gates being 23 feet high and 34 feet wide. A considerable distance south of the last dry-basin is another inlet to a small wet-dock, which belonged to the late Duke of Bridgewater, and is used by the flats which trade between Manchester and Liverpool, by Bridgewater's canal, these carry 50 tons, and 42 of them belonged to his grace. Proceeding further along the shore southward, we arrive at another inlet and dry-basin, from the north side of which is the entrance to the King's Dock, the fourth which was made (being finished in 1788), and is a regular parallelogram, of 290 yards long and 90 wide, the gates thereof being 25 feet high and 42 feet wide. From the head, or east end of the last dry-basin is the entrance to the Queen's Dock, which was the fifth and last that was made, being also the largest and most complete of the whole, its length is 270 yards, breadth 130, its gates 25 feet high and 42 feet wide, and it cost about 25,000/. An attempt was made to form a dock in the site of the old Dock, as long ago as 1761, but it was not until the year 1797 that the first act was obtained, of which there are several, for building and regulating the present docks. In 1799 application was made again to parliament for powers to build two more large docks, one of them more northerly than any of those we have described, and the other in front of Salt House dock. The whole extent of these docks and quays will then be nearly 2 miles by the side of the Mersey! With the two dry basins last described, several convenient graving-docks connect, for the building or repair of ships, some of the latter are long enough to hold three ships in length. The space between their graving-docks and in front of the docks, is principally occupied by timber-yards. The draw-bridges over the entrances to some of these docks are among the largest and most complete in England: Mr. Morris erected and has the care of them and the docks. On the south side of the King's Dock is a spacious warehouse 210 feet long and 180 wide, for tobacco, of which it will contain 7,000 hogheads. The spring-tides here rise 21 feet, but the neap-tides only 12 feet, on which account large ships cannot enter or leave these docks for some days during the lowest tides. Fires and smoking of tobacco are on no account allowed on board of ships in these docks, nor lighted candles, except in proper lanterns, and no gunpowder is allowed on board; by a strict attention to which rules, no fire has ever happened in these docks. In the year 1797 the tolls in these docks amounted to upwards of 13,000l. annually, and their yearly expenses to 5,100l but a debt of 113,419l. still remained on them: for many of the above particulars we are indebted to W. Mepfi's Liverpool Guide. In the year 1737 Worlsey
Warley Brook was intended (and an Act passed to Geo. II.) to be made navigable; and, in 1758, a branch of Bridgewater's canal was intended to join at Hollin Ferry, but neither of these has been executed. In 1771 Mr. James Brindley proposed an aqueduct-bridge over the valley of the Mersey, for the use of the intended Liverpool and Manchester canal; and in 1801 Mr. Ralph Dodd tried to persuade the adoption of a road-bridge over the same at Castle Rock, near this place, 442 yards long, which he stated might be built for £1,000. In 1799 it was suggested that a tunnel might be made under the Mersey at Liverpool to the opposite shore in Cheshire, 3 of a mile; in the same year it was in contemplation to build an aqueduct over the Irwell, for the use of the Manchester Bolton and Hurst canal, to enable it to join Bridgewater's canal; and in 1804 it was proposed to bring the Weaver navigation to Welsford Point on this navigation, by a new-side cut, near that river from Frodsham, to avoid the shallows near the junction of the rivers. In 1798 the price of carriage on this navigation, between Liverpool and Manchester was 12d. per ton, but on the completion of Bridgewater's canal it fell to 6d. per ton.

Milkford Haven. This famous estuary and harbour for large ships, has nearly an equal course, for about 17 miles, in the county of Pembroke, in South Wales, commencing in St. George's channel, and terminating near Landshutting ferry, where it is joined by the Dougold and Clyfe rivers: it has also creeks or branches extending to Pembroke, to near Carew Castle, to Crefwell, to Nangle, &c.

Monkland Canal. The general direction of this canal is nearly east, for about 11/2 miles in the county of Lanark in Scotland, its calern end is considerably elevated; its objects are the supply of Glasgow, Paisley, &c. with coals from Monkland collieries, and the export of farming produce. It commences in the basin of the branch of the Forth and Clyde canal, and thereby communicates with the Clyde river, and the Edinburgh and Glasgow canal. Glasgow is the 5th British town, with a population of 77,585 persons. In 1803 the Glasgow and Saltcoats canal was proposed to connect with this at Glasgow.

Monmouthshire Canal. Acts 32, 37, and 42 of Geo. III.—The general direction of this compound of canals and rail-ways is nearly north, for 173 miles, in the counties of Monmouth, and Brecknock in South Wales; its northern ends are very greatly elevated; its object is the export of coals, lime, and iron from the country through which it passes; near Pontypool it is joined by the Brecknock and Abergavenny canal, at Pill-Gwenny it joins to the Sirhowy tram-road (by means of the Uske river), and at Count-y-Billa farm, and at Rifa, it joins the same again by different branches belonging to this company. Newport and Pontypool are considerable towns on this line. This canal commences in the tide-way of the Uske river, near to the Severn, at Pill-Gwenny, and terminates by a rail-way extension at Blaen-Abio: iron furnaces, having also a principal branch of canal from the line at Cr常务-Farm, near Malpas, and continued by a rail-way to Beaufort iron-works, 21 miles; from this branch are rail-way branches to Nosse furnaces, 12 miles, to Nant-y-glo works, 64 miles, and another to the Sihowmy tram-road at Rifa: from the line near Pontypool is a rail-way branch, 1 mile, to Tronfaunt furnace, and another, of 2 miles, to Blaen-Dir furnace. From the Uske river to Pont-Newydd, 121 miles, is a rise of 447 feet by the canal, and thence to Blaen-Abio, 42 miles, is a rise of 560 feet by the rail-way: from Cr常务-Farm to Crumlin bridge the canal branch rises 458 feet in 11 miles; thence for 3 miles to the rail-way bridge over Ewyby river, 3 miles, the rail-way has a rise of 159 feet, and thence to Beaufort, 7 miles, it has a rise of 460 feet; the Nant-y-glo branch has a rise of 518 feet, along the side of Ewyby-Brach river. The locks are 60 feet long and 10 feet wide, their paddle holes are, in some of them, united in the breach of the lock, and no thrust-plate, or inverted arch has been made below the lower gates. Much deep-cutting and embankments have here been necessary, to obtain the proper flowing for the rail-ways and juncled planes. Mr. Thomas Didsford jun., is the engineer: in February 1766 the canal was opened from the Uske to Pontypool, and in the same year the Beveron branch was completed. This company was authorized by their different acts to raise 227,552l. in 1801. rates, viz. in 1802 these divided at 12s. 6d. each annually; it is provided, that after the profits amount to 10 per cent. and 100l. is accumulated as a fund, the tolls are to be reduced, first on coals, so as to keep the profits within that amount. The tolls and exemptions are various, and may be consulted in Phillips's 410. History, Appendix, p. 118 and 119, where tolls are specified for cattle passing on the rail-ways. Nine miles of the Sirhowy tram-road was made by this company, who receive the tolls thereof, as also 110l. per annum from that company, on account of the junctions therewith to the Brecknock and Abergavenny company this company paid the sum of 3000l. for the benefit of their junction herewith, and their taking the fame tolls only on goods passing on it from this canal as are charged hereon. Rail-way branches may be made to any works within 8 miles of this canal or its branches. In the year 1805 it was proposed to continue this canal lower down the Uske river, to avoid its imperfect navigation.

Montgomeryshire Canal. Act 34 Geo. III.—The general direction of this canal is nearly S.W. for 27 miles in the county of Salop and of Montgomery in North Wales; it is considerably elevated, particularly its southern end; its objects are the supply of the country with lime, the export of its farming produce and of coals, slate, free-stone, iron, lead, &c. from different parts near the line: it connects with the Sirhowy river at Wellington. Wellington, Montgomery, and Newtown are considerable towns on or near this canal: it commences in the Llanymynach branch of Ellesmere canal, at Portway lime-works in Llandyblodwel, and uniting with the same again near Verniew river in Llanymynach, it terminates at Newtown: it has a cut of 32 miles to the Severn river at Wellington and to Guilsfield. From the Ellesmere branch to Newtown is a lockage of 255 feet; the Guilsfield cut is level. Mr. Thomas Didsford jun. is the engineer. In August 1797, 16 miles of the canal were finished and opened from the Ellesmere branch to Garthmill near Berwick. The company were authorized to raise 22,000l.; the amount of each share 103l. The water of Lledan Brook is to be taken to supply this canalfor 24 hours weekly, from Saturday to Sunday evening; the company are bound to purchase certain mills, if their trade is injured by the canal: and certain creditors on turnpike tolls near the canal are also indemnified: the profits are not to exceed 10 per cent. but the tonnage is to be reduced, but not so as to bring the profits below 8 per cent. the rates of tonnage and exemptions are various; see Philp's 410. History, Appendix, p. 151 and 152. About the year 1794 the Wellington and Leominster canal was proposed to join this near Wellington.

Neath Canal. Acts 31 and 38 Geo. III.—The general direction of this canal is nearly N.W. for about 14 miles in the county of Glamorgan in South Wales; and its northern end is considerably elevated; its object is the export of coals, iron, lime-stone, &c. from the mines and works near the line; which continue in the tide-way of the Neath river, at Giants-grave pill in Briton's-Ferry, and terminates in the Aberdare rail-way branch at Abernant near Furno.
Vaughan: being joined near Briton's Ferry, in the Neath river, by the New Chapel canal. Neath is the only considerable town on this line; near Merlin's Court is an aqueduct over the Neath river. This company were authorised to raise £3,500; they are authorised to make railway branches to any place within 4 miles of the line, by consent of the land-owners. In 1798 this canal was nearly finished, except about two miles at the lower end. Here is a singular provision, that the rates of warehouse-room are to be the same as are charged by the Staffordshire and Worcestershire company at the Stourport warehouses.

Neath River. The general direction of this navigation is nearly N. for about 4 miles in the county of Glamorgan, in South Wales; the tide flows through its whole length from Swansea bay to Neath bridge; at Giants grave hill near Briton's Ferry it is joined by the Neath canal, and near Briton's Ferry by the New Chapel canal; its chief objects are the supply and trade of Neath, and the export of the coals and iron brought down by the canals.

New River (lower district.) Acts Geo. II., and 34 of Geo. III.—The general direction of this navigation is about S.W. by a very crooked course of nearly 75 miles in the counties of Cambridge and Huntingdon, and skirting those of Lincoln and Northampton; this is by what appears to have been its ancient course through the Fens, beginning in the tide-way at Peter's point about 9 miles below Wisbech, passing that town, where is a bridge built of stone with one flat semi-elliptic arch of 70 feet span; and turning south-eastward by an ancient course (which is now rendered useless to navigators by the Wisbech canal, which joins this river at Wisbech and again at Outwell), to Outwell and Apwell, thence to March and Benwick, thence through Ramsey, Ugg, and Whitleafie Mea, through Horfey-bridge, and Standground sluice to Peterborough, and thence by the regular channel of this river to the commencement of the upper New navigation at Thriftpon; in after times, a navigable course has been opened, for part of the waters of this river through Well-Creek, about 5 miles in length, from near Outwell-church to the Great Ouse river at Salter's-Load; another from Standground (14 mile below Peterborough) through Catt-Water and Shire Drain of about 24 miles in length to the New river again at Gunthorpe-fluide (about 63 miles below Wisbech), this last having a cut of about 2 miles in length from it into the old Welland river near Crowland; in 1490, bishop Moreton cut a new artificial course 40 feet wide and 13 miles long, called Morston's Leam, for a part of these waters, from Standground fluice (about 2 miles below Peterborough) to near Guyhirne, and thence 3 miles by an old channel to the New again near Wisbech; also, at Benwick this river is joined by the Benwick-Meer bridge, of the Great Ouse river. The above will serve to give some idea of the principal lines of navigation belonging to this river through this surprizing country; but as all the rivers, and all drains almost in the fens are embanked on both sides, and owing to the deficiency of fall are almost still water, there are a great number of smaller navigable branches intersecting and crossing each other in all directions, so that it would be in vain for us to attempt to describe them. The powers of the commissioners under the above acts, extend only about 30 miles downwards to Peterborough bridge; the navigations through the fens are preferred by the fen corporation in maintaining their drainage works. In 1771, Mr. Nathaniel Kinderly recommended the cutting of a new channel or outfall for this river (as has been since successfully practised by him on the Dee river at Chester) from the mouth of Shire-drain at Gunthorpe-fluide straight along the N.W. shore for 2 miles to Peter's point; and the work was begun, but the mistaken notions of the people of Wisbech then, and till lately, prevented its completion: we are glad, however, to hear, that the scheme is likely now to be soon accomplished, and a greater depth of water obtained in this river, and through Croft's key's wash to Lynn and Bolton deeps. By the act for Wisbech canal 34 Geo. III., all vessels passing out of or into that canal from the New are to pay 3d. per ton, out of which 10cl. is to be paid annually to the commissioners under the above acts for improving this river above Peterborough, and the remainder is to be applied to deepening and improving the fame between the Wisbech canal at Outwell and the Ouse river at Salters-Load. Boats which have paid the above toll are to pass toll free at Salters Load, and Standground sluices on this river.

New River (upper district.) The general direction of this navigation is nearly S.W. for about 23 miles, in Northamptonshire: it is not greatly elevated; its objects are the supply of Northampton and the surrounding country with coals, deals, &c. and the export of agricultural productions. The communication between Lynn, London, Liverpool, Manchester, &c. which it now effects is also important. Northampton is the 8th British town with a population of 24,200 persons, Wellingborough, Thrapston, and Higham-Ferrers, are also considerable towns on or near this river; it commences in the lower New navigation at Thriftpon, and terminates at the railway branch of the Grand Junction canal at the town of Northampton, where also it is to be joined by the Leicestershire and Northamptonshire Union canal. This navigation has been improved by a great number of tide-cuts and pound-locks by the tide of the river in different places; it was completed and opened to Northampton on the 7th of August 1761. About the year 1793, the Leicester and London canal was proposed to cross this river near Wellingborough.

Newark and Bottesford. In the year 1793, a canal was intended from the Don river at Newark to the long level of the Grantham canal at Stainworth, passing near the town of Bottesford. In the Grantham, act 33 Geo. III., the tolls are provided that are to be paid at the junction of these canals, if this is ever executed.

Newcastle and Carlisle. In the year 1795, Mr. William Chapman surveyed the line for a canal from the Tyne river at Newcastle to the Eden river at Carlisle, through Durham, Northumberland, and Cumberland, crossing the grand-ridge for a connection between the east and west seas; and having a collateral branch of narrow canal and inclined planes to the elevated mining districts of Weardale and Teedale forests, &c. the ultimate being 355,067. On the rejection or suspension of this scheme, a canal from Newcastle to Haydonbridge was proposed as below.

Newcastle and Haydon-Bridge. In 1796, and again in March 1802, it was in contemplation to make a canal nearly following the course of the Tyne river, between Newcastle and Haydon, in Northumberland and Durham.

Newcastle and Maryport. Some years previous to 1807, a canal was projected between the tide-way in Maryport harbour and the Tyne river at Newcastle, crossing the grand ridge, and passing between the two seas, though Cumberland and Durham counties: a bill for the same was brought into parliament, but rejected, owing to the opposition that the founders of another scheme gave to it: in 1807, the scheme was again revived, but nothing effectual has been done towards its adoption.

Newcastle (under-line) Canal. Act 33 Geo. III.—The general direction of this navigation is nearly west, by a very bending course of 3 miles, in the county of Stafford: its objects are the bringing of Caldon lime for manure, and...
and the export of coals and farming products: it is considerably elevated. Newcastle is a considerable town, and its neighbourhood very populous. This canal commences in the Trent and Mersey canal (near to the end of the Caldon branch) at Quinton's Wood, in Stoke, and terminates in the Newcastle-under-Lyme Junction, at the south-east corner of Newcastle town. It was completed in a short time after the act was obtained, the company being authorised to raise £10,000; the amount of shares therein is only 501. each. The rates of tonnage and wharfage are on coals, lime-flour, and iron-flour 2d. per ton per mile, on all other goods 2d. per ton per mile, but for less than a ton of any article in a boat 6d. Between December and the 1st of April this company may take flood waters from the Trent river.

Newcastle-under-Lyme Junction Canal. Act 38 Geo. III.—The general direction of this canal is about N.W. for a short distance, in two detached parts, in the county of Stafford: its western ends are much elevated, and terminate near the grand ridge on its eastern side: its object is the export of coals and agricultural produce. Newcastle is a considerable town on its line. It commences in the Newcastle-under-Lyme canal, at the S.E. corner of that town, and terminates its eastern part in the canal of Sir Nigel Bowyer Greffey, near the S.W. corner of the town; its western part commences in Greffey's canal above mentioned, near Apedale, and extends to Partridge-Neet collieries, with a branch to Bignell-End collieries. This company were authorised to raise £12,000, the amount of their shares being 50l. only: provision is made in the act for inclined-planes and water-levels, or rail-ways, with engines to raise water or drain wells, &c. in case any of these should be found more eligible than a canal with locks, in any part. Pleasure boats to pay for 6 tons if they pass any lock. In 1795, the Commercial canal, for 40 ton boats, between the Afsby and Chelfer canals, was proposed to occupy or pass through the line of this canal, when enlarged.

New Chapel Canal. The general direction of this canal is east, by a bending course of about 33 miles, in the county of Glamorgan, in South Wales; the greater part of it is cut through a morass, but little above the level of the tide-way in which it commences, in the river Neath, near Briton's Ferry (near the entrance of the Neath canal), and terminates at New Chapel, near Swansley; it is the sole property of the owner of the land, and for whole improvement, by draining and otherwise, it was principally undertaken.

Newport and Stone. In June 1797, it was proposed to make a canal from the Donnington Wood canal (the marquis of Stafford's) at Page-lane, near Newport, by Eccleshall, to the Trent and Mersey canal, near Stone, a course of about 18 miles, in the counties of Salop and Stafford, crossing the grand-ridge; a branch was proposed to Market-Drayton: its object was the opening of a direct communication between Shrewsbury, and other places on or near the upper parts of the Severn, and the Trent and Mersey canal, for supplying the intermediate country with coals and lime, &c. In 1765, the Trent-bridge and Winsford canal was proposed, and intended to pass through nearly the fame ground as the middle parts of this canal; as was also the Sandbach on an other occasion.

Newry Canal (Ireland). This canal, from the tide-way at Fadham point to the town of Newry, was completed under the direction of Mr. Colborne, in February 1761, after being two years in hand, by which brig of 80 or 100 tons burthen can come up to Newry; it was intended to extend this to the Blackwater navigation, for conveying the Dun-gannon and Drumglis coals to Dublin; and the Irish parliament, between 1753 and 1771, granted different sums of the public money for this purpose, amounting to £1,434, but the work then was far from being completed.

Nith River. The course of this river (sometimes called the Nid) is nearly north for about 9 miles, between Dumfries and Kirkcudbright counties, in Scotland; the tide flows through its whole length, and its object is the supply of Dumfries, (the 7th British town, with 7,583 persons); it commences in Solway Firth, and terminates at Dumfries bridge, which is of stone, with 13 arches. In 1763, Mr. John Swinton was consulted on the improvements by jetties of flake and flutons for gaining land, that had been made at Cargin, Lagal, and Netherwood, on this river, and recommended the removal of some of these works at the projecting points of the river.

Nottingham Canal. Act Geo. III.—The general direction of this canal is nearly N.W. by a crooked course of about 15 miles, in the county of Nottingham; it is not very greatly elevated: its objects are the export of coals from the several mines near it, and of farming products, importing lime, deals, &c. Nottingham is the 17th British town, with a population of 28,861 persons. This canal commences in the river Trent, near Nottingham (opposite to the junction of the Grantham canal), and terminates in the Comford canal, near Longley bridge, and near to the termination of the Erewafla canal: near to its southern termination it is joined by the Trent canal, or side-cut (from the Trent and Mersey canal). A reservoir is made near Amflethworth for the supply of this canal, and has a full-regulating sluice which lets out near 3000 cubic feet of water per hour for certain mills and the Erewafla canal. In 1803, this canal was completed.

Nutbrook Canal. Act 33 Geo. III.—The general direction of this canal is nearly N.W. for 5 miles, in the county of Derby: it is not greatly elevated: its object is the export of coals from the mines near the line; which commences in the Erewafla canal, near Stanton, and terminates at Shipley colliery; it has a branch to Welf Hallam collieries. Sir Henry Hanlouce and Edward Miller Mundy, esq. were authorised to raise 19,500l. between themselves, in 100l. shares; their profits hereon are not to exceed 8 per cent.; and proprietors of adjoining lands may make side branches thereto: the particulars of the tonnage rates are very long, including some regulations with the Erewafla company, &c. See Phillips's 410. History, Appendix, p. 104 and 105.

Oakham Canal. Acts 33 and 40 Geo. III.—The general direction of this canal is about S.E., by a crooked course of 15 miles, in the counties of Leicesters and Rutland: its southern end is considerably elevated, crossing the Tilton and Burley branch from the grand-ridge: its objects are the supply of Oakham, and the country through which it passes, with coals, deals, &c., and the export of agricultural products. Oakham and Melton-Mowbray are considerable towns on this line, which commences in the Leicesters and Melton-Mowbray navigation, at Melton-Mowbray, and terminates at the town of Oakham. From the Leicesters and Melton-Mowbray navigation to Edmondthorpe, 8 miles, it has a rife of 130 feet; the remaining 6½ miles to Oakham are level, and it is fed by a reservoir for flood-waters in Langham, and another in Saxby. The engineers were Mr. William Jessop and Mr. C. Staveley, jun. In November 1800, this canal was opened from Melton-Mowbray to Saxby bridge, and in January 1803, the whole was completed. This company was authorised to raise 86,000l. in 100l. shares. The rates of tonnage and wharfage, with the exceptions therefrom, may be seen in Phillips's 410. History, Appendix, p. 106 and 107; but to which the last act made an addition, and
and the Leicester and Melton-Mowbray act, 40 Geo. III.,
also contains some regulations affecting the tolls at
the entrance to this canal. Earl Wynchellca is to be paid £1.
anually, in lieu of his customary dues on coals sold in Oak-
lam town.

OUSE RIVER (Lewes lower Navigation). Act 31
Geo. III.—The general direction of this navigation is nearly
north, for near 9 miles, in the county of Suffolk; the tide
flows through its whole length: its objects are the import
of coals, deals, &c. and the export of farming
products. Lewes is a considerable town on this navigation;
which commences in the English channel, at Newhaven
harbour, and terminates in the upper Ouse navigation, at
Lewes bridge: the meadows, called Lewes and Langhton
Levels, near this river, were subject to be overflowed, and
it is part of the object of the above act to embank the river
and its tributary streams, and to erect proper sluices, and cut
drains for the improvement thereof; part of the money
for which draining purposes, is to be raised by the commissioners
of fewers, under the act of 23 Hen. VIII., by different
rates per acre on each of the five districts into which the
levels are by this act divided, but the works are to be per-
formed by the trustees appointed by this act, who, in 1802,
completed the straightening and deepening of the course of
the river, so that the tides flowed higher and ebbed lower than
before at Lewes bridge, and to which place vessels drawing 4
feet of water can now come up. The tolls on articles navigated
on any part of this river are to be, for manures not exceeding
2d. per ton, for road-materials 3d., and for all other goods
4d. per ton, empty boats to pass toll free; these tolls are
to be not to be lowered (except road-materials to 2d.), so long as
1/4 of the money borrowed on the credit of these tolls and the acre-taxes, remitted and discharged; the tolls are intended hereafter to be so reduced, that one-third of the
whole expenses of maintaining the navigation and drainage
works shall be paid by the acre-taxes, and two-thirds by the
tolls on the river; the acre-tax is, however, to make up the
deficiency, if the above tolls are inadequate; lands below
Newhaven bridge are not to be taxed, but to maintain their
own banks. In the year 1762, Mr. John Smeston was
consigned about improving the navigation and drainage of
this river. About the year 1793, a new pier was built to
protect the harbour of Newhaven, and the entrance of
this river; in 1802, it was proposed to add a new groin thereto to the wellward, for the further security of vessels;
and, in 1804, it was in contemplation, by large flumes from
the neighbouring cliff, to extend a rough unwall'd pier
much further out into the sea, for the security of vessels on
this coast.

OUSE RIVER. (Lewes upper Navigation). Act 30
Geo. III.—The general direction of this navigation is near
north-west, by a bending course of about 22
miles, in the county of Sussex; it is not much elevated
above the level of the sea: its objects are the import
of coals, deals, &c. and carrying chalk and manures to
the lands, and the export of their agricultural products.
Lewes and Cuckfield are considerable towns on this line;
it commences in the lower Ouse navigation, at Lewes bridge,
and extends to Hammer bridge, near Slaugham, with a
branch to Offham chalk-pit, in Hamfay; the depth of
water in every part is to be made 3½ feet; the boats to be
50
feet long and 12½ feet wide, and are not to pass locks with
less than 10 tons of lading. This company were authorised
to raise £25,000. in 100l. shares, and the works were not to
commence until £10,000. of this was subscribed, and 10
per cent. thereon actually paid: it is to that public spirited
and worthy nobleman lord Sheffield that the country are in a
principal degree indebted for bringing about this useful
measure. From Lewes bridge to Barcombe mill there was
an old and imperfect navigation for small boats; on this part
of the line, the rates of tonnage are to be, on manures,
road-materials, timber, grain, &c. 4d. per ton per mile, and
on all other goods 1d. per ton per mile; on the remainder of
the part of the line, manures, &c. as above, are to pay 1d.
and other goods 1½d. per ton per mile. Empty boats to pay
1½s. for passing each lock, and pleasurable boats 3d. below and
6d. above Fretthill bridge for passing locks. Between Old
Eye, in South Malling, and Land-Port, no toll is to be
charged, on goods carried no farther. Branches may be made
to any place within 2000 yards of this river, on which the
powers of the commissioners of fewers (23 Hen. VIII.) still
continue. In 1801, it was proposed to make an extension of
the Sarry iron road-way to join this navigation at Linfield.
In 1802, the navigation was not completed up to Hammer
bridge; but, in the following year, it was said that a new
act for further powers for that purpose was in contemplation.

OSE (great) River. The general direction of this river is
nearly S. W., by a crooked course of about 84 miles, in the
counties of Norfolk, Cambridge, Huntingdon, and Bed-
ford, and skirting Suffolk for a short distance: this course
through the fen being from the tide-way in Lynn deeps; (2
miles below that town), palt Lynn, Teleny, Salter's Load,
Denver-fluice, Rebeck, Little-port-chair, Ely, Harrimore,
Hermitage-fluice, Erin, and thence by the regular channel
of this river to Bedford. Soon after the year 1630 (in
consequence of a law of fewers of the 13th of January, 6
Chars I.) the old Bedford river, (a straight cut, of 21 miles
long and 70 feet wide), was made, between Hermitage-fluices
and Salter's Load, for conveying part of the waters of this
river, and in 1652, the scheme of Sir Cornelius Vermuyden
for another navigable cut nearly parallel with the last
was carried into effect, (under the authority of an act of Crom-
well, 1649, confirmed afterwards by 15 Charles II. estab-
lishing the fen corporation); this last, called the New
Bedford river, is 30 miles long and 100 feet wide, from
Hermitage fluices to Denver's fluice, both these new cuts
falling into the great Ouse river again, at Salter's Load and
Denver's fluice (which are within about a mile of each
other, and 17 miles from Lynn); besides these, part of
the waters of this river make their way by a navigable cut of
about 12 miles in length, from Hermitage into the Nene river
at Benwick. In 1725, Mr. Thomas Badenclafe mentioned, and,
in 1751, Mr. Nathaniel Kinderley strongly recommended,
another shorter cut between Eaubrick and Lynn, for
straightening the course of this river, for which the acts of
the 35, 36, and 45 of Geo. III. have been passed, called
the Eaubrick cut, and on which Mr. Robert Mylne, sir
Thomas Hyde Pagge, and captain Joseph Hudlart are em-
ployed as engineers: this cut was, in September 1804,
marked out, and is intended to be 295 feet wide at the east
end, 204 feet at the west end, and about 2¼ miles in
length, making easy bends into the river at each end, with
banks on each side, at a distance from the cut, 6 feet higher
than the ordinary tides, of 15 feet rife, with an embank-
ment and sluice across the old channel, above the east
entrance of the new one; which important works are ere
performed, at the end of 1805. Near the harbour of Lynn
this river is joined by the Lynn river; at Rebeck, a branch of
the Nene navigation (called Well Creek); between Salter's Load and Denver's fluice it is joined by Stage river,
at Rebeck the little Ouse jogs; at Prick-willow the Lark
river joins; near Barkway chapel the Sobham-Lode; at Harri-
mere, the Cam river joins; and at Tempsford the Ivel
river also joins; the whole of the rivers and large drains in
the
Oxford Canal. Act 9, 15, 16, 144 and 30 of Geo. III.—The general direction of this canal is nearly north, by a very crooked course in its northern half, of 51 miles, in the counties of Oxford, Warwick, and Northampton; it commences on the grand-bridge by a tunnel, and its northern part skirts about near to it on both sides the Avon, to a distance of 45 miles; its object was a communication between the seaports and the metropolis, (but a much nearer route, now opened, by the Grand Junction canal,) the supply of the northern parts of Oxfordshire with coal, the export of farming products, &c. At Woolnorton is a cut of about 4 feet (belonging to the Duke of Marlborough), by which a communication with the Thames and Isis navigation at Godlawn is effected. At Napton the Warwick and Nanton canal joins this; and at Brummelton the Grand Junction canal joins. Coventry is the 24th British town, with a population of 16,033 persons; and Oxford is the 38th, with 11,694 persons. Woodlock, Deddington, Banbury, Southam, Daventry, and Rugby are also considerable towns on or near to this line of canal; which commences in the Thames and Isis navigation at Beddington's Garden, on the west side of Oxford city, and terminates in the Coventry canal at Longford. At Hillmorton and at Napton are short cuts, of about a half mile each, to the steam-engines belonging to this company. From the Thames and Isis at Oxford to Banbury, 27.4 miles, is a rise of 118 feet by 16 locks (including 2 weir locks and an entrance lock from the Isis); thence to Chilson, 74 miles, is a rise of 74.4 feet by 12 locks; thence (through the Fenny-Compton tunnel) the summit pound continues to Market; 55 miles, and level; thence to Napton on the fall 3 miles, is a fall of 53.4 feet by 9 locks; thence to Hillmorton, 16.5 miles (in which the Warwick and Napton and the Grand-Junction Join), is level; thence to Little, 3.4 miles is a fall of 19 feet by 3 locks; thence to the Coventry canal at Longford, 26.5 miles, is level. The two short cuts to the engines, and that at Woolnorton, are level. This canal is 25 feet wide at top, 16 feet at bottom, and 4.5 feet deep, except the summit pound, which is made 6 feet deep in order to act as a resevoir; the locks are 74.4 feet long, and 7 feet wide. At the toll-house near Longford is a lock-bridge, to prevent the Coventry canal in dry seasons, from lowering the water in the long pound on this; from which long pound an engine at Hillmorton pumps water into the Birmingham pound, by means of a feeder; and out of this last pound by means of a longough. Another engine at Napton pumps into the summit pound, which is also fed by three resevoirs. The number of stone and brick bridges on this line is 185, and of wooden, swing, draw, and foot bridges 66. The Fenny-Compton tunnel is 1188 yards long, 9.3 feet wide, and 15.5 feet high. At Newbold is a tunnel 225 yards long, made under the church-yard and street, 16 feet high, and 12.5 feet wide, with a tow-path through it. At Wolhamcote, also, there is a short tunnel. At Peders-Bridge near Brinklow is an aqueduct bridge of 12 arches, of 22 feet span each. At Cosford on the Swift river, and at Clifton on the Avon, are others of 2 arches each; at Wolhamcote, Adderbury, and Hampton-Cay, are other smaller aqueducts. Mr. James Bradley made the survey for this canal in September 1768; in August 1769, he began the work near Longford; and in 1775 it was completed from thence to the Napton locks; when 124,000l. having been expended, the works stood still for want of money until 5th April 1786, when they were resumed; on the 31st of March 1778 the line was opened northward to Banbury; and on the 1st of January 1790 the whole was completed. Mr. James Barnes was employed to execute some of the digging of this part. This company have been authorized

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authorised to raise, by their different acts, 330,000l.; the amount of their shares is 100l. each. In January 1800 there are said to have sold for 10s. l., and in 1802 for 27s. 5d. each; the Grand Junction company being bound to make up the tolls hereon to 10,000l. annually, (if the works are kept in order) on condition of this company taking only certain tolls on goods palling to or from that canal, (see Phillips's 4to. High. Agric. p. 336.) and agreeing to widen about 35 miles of their canal and locks, that large boats may pass north of Bhamton, whenever the Grand Junction company shall require the use of them, and the Coventry company. The rates of tollage are under complicated; they will be found in Coach's Island Navigation, pages 59, 74, and 82. For parcels under 5l. the company are to fix specific rates in their printed tollage tables. Coals from the inland pits were not allowed, by the first act above, to come nearer to London than Oxford; but by the 2d act, this was extended to Reading and the Kennet navigation; and in the year 1800 the company offered 25. per ton as a premium on coals carried certain distances from their canal into Berkurk, &c. Small narrow barges used on this canal seldom venture down the Thames to London, but goods are generally shifted at Oxford into the Thames-barges. About the year 1792 the Cranford and Crewe's canal was proposed to join this at Capercy; and, at the same time, a canal from Hampton-Cay to Sloughworth was intended, to join this at Hampton-Cay.

Parke's Canal. This short canal, or rather waterway, has nearly a north direction for about 3/4 mile in the valley north of St. Aulde, (near the south coast of Cornwall) one mile above that town; it commences within an immense excavation of great depth, and open to day, which has, by the work of ages, been made in a rocky hill abounding with tin ore. It is tunneled through the solid rock for 200 yards or more, on a level to the surface of the hill, and proceeds forwards thereon to the top of an inclined plane, of about 50 feet fall, where the boats are raised up an end by a windlass to shoot out the ore, as already described on St. Columb canal. At the bottom of the plane the ore is loaded into carts, to be carted to the flamping-mills. Small square-headed boats are used, and four or five of them are linked together to be shoved through the tunnel, by means of chains which are fixed along its sides for that purpose, and they are afterwards turned along the canal to the head of the plane. This canal, tunnel, and plane, were made at the expense of Mr. Parke, who owns the mine, about the year 1770, before which the ore was drawn up to the top edge of the pit or mine, and carted from thence.

Parret River. The course of this river is nearly south-east for about 5 miles, in the county of Somerset; it is not greatly elevated; its objects are the import of coals, and the export of agricultural products. Langport is the only considerable town near this navigation. It commences in the Tone and Parret navigation at Borough-Chapel, and terminates in the Icelakefer and Langport navigation, a little below Langport.

Peak-Forest Canal. Acts 34, 40, and 45 of Geo. III.—The general direction of this canal and railroad is nearly south-east for 21 miles, in the counties of Chelfer and Derby; its southern end is very considerably elevated, and terminates on, or very near to, the Grand-Ridge; its principal object is the export of the Peak-Forest lime, and of coals from the neighborhood of this canal. Ashton-under-line, Stockport, and Chapel-le-Frith are considerable towns on or near this line; which commences in the Manchester Afton and Oldham canal, at Dukdenfield, (near to the termination of the Huddersfield canal,) and the canal terminates at the bafon and lime-kilns in Chapel-Milton, whence a railway proceeds to Loads-knoll lime-kiln quarries in the Peak. The line of the canal is 15 miles in length, and of the railroad 6 miles; there is a cut of 1/3 a mile to Whaley-Bridge, and a railroad branch of 1/2 mile to Marple. Over the Merley river, near Marple, is a grand aqueduct bridge of 3 arches, each 60 feet span and 75 feet high, the whole height of the structure being near 100 feet, which was built in the year 1799. (This bridge we have before, by mista¬
take, when treating of Aqueducts, mentioned as being on the Manchester Afton and Oldham canal.) Mr. Benjamin Outram was the engineer, and the works were completed on the 1st of May 1800. The company were authorised to raise by the first act, 175,000l. each share being 100l., which in 1802 bore a premium of 12 per cent. It has been said, on several occasions, that this canal and railroad were completed at 10 per cent. under the original estimate, and that the 2d act authorized the company to raise any unlimited sum that they might want, in which case they certainly were mistakes, because the act of the last session was for raising a further sum of money. For the rates of tollage and wharfage, see Phillips's 4to. History, p. 155. Mine¬waters may be used for the supply of this canal; but only the floodwaters of the rivers.

Pentland Firth. This height has nearly a west di¬rection between Caithness county, at the north-eastern ex¬tremity of Scotland, and the Orkney islands. This, though a rocky and dangerous passage, is much frequented by ships, on account of being the first passage which prelits itself for ships in going northward, between the East and West Seas, or German Ocean and Irish Sea. The Inverness and Fort-William canal, now cutting a great way south of this for the use of ships, is expected much to lighten the use of this firth. Scraiber road-lead, on the side of this firth, is a harbour much frequented by ships in blowing weather. Thurso har¬bour in Caithness, on the southern side of this firth, has a pier now building, and its harbour improving, under an act of 42 of Geo. III.

Poole Canal. Act 37 of Geo. III.—The general di¬rection of this canal is nearly south-east for about 5 miles in Cornwall, near its north-west coast; it is not greatly elevated; its objects are the import of coals, and the export of stone and agricultural products. Bodmin is a considerable town near it. It commences at Guinea-port, near Wadebridge, in the Camel river, and terminates at Dunmore Bridge and Stoney Lane, in the parish of Bodmin, having a collateral cut of 1/3 a mile to Rither Bridge, in the same parish. At Guinea port and at Stoney-Lane Bridge large and convenient basons and warehouses are intended. Mr. John Remie and Mr. Murray are the engineers. This company may raise 18,000l. in 50l. shares. A feeder from the Camel river and any springs within 2000 yards may also be taken for this canal.

Poole Harbour. This spacious inlet or harbour has nearly a west course for about 9 miles, in the county of Dor¬set; the tide flows into every part of its various branches and inlets, and round Branksea island, which is in the middle of it; its objects, besides the general trade and supply of the neighbourhood, is the export of a fine potter's clay found near to Corfe Castle, in the isle of Purbeck, and paving¬stones and free-stone from thence. Poole, Warham, and Corfe Castle are considerable towns near this harbour, which commences in Studland Bay and terminates at Wareham Bridge: a branch proceeds about 21/2 miles north to Creek-Moor. In 1797 several improvements in this harbour were in contemplation.

Portsmouth Harbour. This inlet or harbour has nearly
Canal.

Canals are not found, for about 5½ miles, in Hampshire; the tide flows through it, and the depth of water in most parts of it is insufficient for the large ships of the British navy. Portsmouth is the 13th British town, with a population of 32,160 persons; Gosport and Fareham are also considerable towns adjoining it. It commences at Spithead and the Channel, between Emsworth and the Isle of Wight, and terminates near Fareham Bridge, having also a branch to Cosham, and a communication thence to Langflown and Chichester harbours. On the shores of this harbour there are immense buildings and works, for the use and security of the royal navy. In 1805 several considerable additions were made to these works, and a bridge between Gosport and Haslar hospital, which Mr. Robert Forbes built five years ago, is intended to be taken down, having proved injurious to the harbour.

Portsmouth and Croydon Canal. In the years 1802 and 1803, a canal was proposed from Portsmouth Harbour to the Croydon Canal at that town, pullying Havant, Chichester, Arundel, Horsham, Rye, and Merthyr, of which the able engineer, Mr. John Rennie, prepared plans and an estimate; but the opposition of the land-owners, and favourers of a railway scheme from Portsmouth to London procured its rejection in parliament. The summit-level of this canal was to be 36 miles in length, at about 200 feet above the level of the sea: this was to be fed by several reservoirs in or near Hotham Porell, containing, in the whole 500 acres, and 340,000,000 cubic feet of water. This level was to penetrate the Chalk-Hills north of Merthyr, by a tunnel 45 miles long, and 350 feet below the top of those hills. The estimated expense was 720,000l., and 800,000l. in 100 years was proposed to be raised; the expected revenue was estimated at 100,000l. per annum. While this line was in contemplation, there was an attempt made by Mr. Ralph Dodd to draw the public attention to a different line of canal, (which Mr. John Phillips laid claim to, as being one of the fanciful ones which he has drawn in the map to his 410. Histon, 1791,) from Portsmouth Harbour, through Southampton Water and the Ichen River, to Winchester; thence to Alresford, near to Alton and Fareham, and to the Wey River at Godalming: from near Welley on that river, the proposed line of the Grand Survey canal was to be followed to Deptford and the Thames river. The estimate mentioned on this occasion was 348,753l.

Portsmouth and London Railway. In 1803, Mr. William Jeffry was employed to survey the line of a railway from Portsmouth to the west end of Stamford-Street, near Blackfriars Bridge, London; on the utility of which, and the Portsmouth and Croydon Canal above, opinions were for some time divided: in the end, neither of them was adopted. The estimated expense of this work was 400,000l.

Ramsden's Canal. Act 14 Geo. III.—The general direction of this canal is nearly south-west for about 5 miles, in the Wilt Riding of Yorkshire: it is not very greatly elevated; its objects at first were the supply and trade of Huddersfield town, but it will shortly have considerable importance as part of the short line of navigation between Hull and Manchester and Liverpool. Huddersfield is the 81st British town, with a population of 7268 persons. This canal commences in the Calder and Hebble navigation, at Cooper's Bridge, and terminates in the Huddersfield canal, at King's Mill near Huddersfield; it has a rise of 563 feet by 9 locks. Sir John Ramsden, who is the sole proprietor of this canal and of Huddersfield towm, in 1760 employed Mr. James Brindley to plan this canal; and, after his death, it was begun and quickly completed by Mr. Luke Holt. At Huddersfield spacious warehouses are built by the side of this canal, to which goods intended to be there lodged may be carried toll free along the part of this canal from the Huddersfield canal; that company guaranteeing the tolls on this not to be levied elsewhere. On the whole length or any part of this canal, coal, flags, flax, flaxen, hemp ropes, and linen, are to pay a toll of 3d. per ton, and all other goods 6d. per ton, excepting sheep and manures, which are to pass free. The proprietors' profits are never to exceed 6 per cent, upon the monies laid out therein.

Reading and Maidenhead. In 1770, a canal was proposed from the Thames river, at Bolter's Lock west Taplow-Hall, (at the western termination of the Maidenhead and Eton proposed canal) to the Thames again, at Sunning near Reading, and to the Kennet river, on which Mr. James Bradley was consulted by the city of London, the distance being near 15 miles by the canal, and by the river above 30 miles, between the same places; a barge of 120 tons being 3 days (and often in dry times as many weeks) in performing the voyage, at an expense equal to 5fl.; while, by this canal, it was calculated that a barge might at all times, except flood, perform it in 10 hours, at 4l. 7s. expense, including 3d. per ton to the trustees as a toll. This canal was at first proposed to commence at Monkey island in the Thames, which is 2 miles below Maidenhead-Bridge. No private property was to be allowed in this canal, but the money was to be raised by life annuities, out of which, and the tolls, the river navigation was to be improved between Bolter's Lock and Sunning, without any new tolls being charged thereon; and when a sufficient fund was accumulated for repairs and management, the tolls were to cease, and the canal be entirely free.

Ribble River. The direction of this river is nearly east for about 12 miles in the county of Lancaster; the tide flows through its whole length; its objects are the supply and trade of Preston town, and the export of coal brought down by the Douglas river, which joins it near Halideth. Preston is the 37th British town, with a population of 11,887 persons. This river commences with a very wide estuary or mouth in the Irish Sea, but grows very shallow, so as to be fordable at low-water, and terminates at the bridge at Preston, near to the aqueduct bridge, on which the Lancaster canal crosses this river. In September last, (1805) it was proposed to apply for an act for placing buoys, and otherwise improving the navigation of this river.

Ripon Canal. Act 7 Geo. III.—The general direction of this canal is nearly N.W. by a bending course of about 7 miles in the Well, and skirting the North Riding of Yorkshire: its objects are the supply of Ripon, and the export of agricultural products, stone, &c. It is considerably elevated; a Borough-bridge, Ripon, and Aldborough, are considerable towns on or near this canal, which commences in the Terfe river at Milby, near Borough-bridge, and terminates at Ripon.

Rochdale Canal. Acts 34, 40, and 44 of Geo. III. —The general direction of this canal is nearly N.E. by a bending course of 314 miles in the counties of Lancaster and York; it crosses the Grand-ridge by a deep-cutting: its general objects are the communication between Liverpool and Manchester, with Halifax, Wakefield, Hull, &c. the export of coals, paving-flenses, &c. At Piccadilly street in Manchester it is joined by the Manchester Ashton and Oldham canal. Manchester is the 2d British town, with a population of 84,020 persons; Huddersfield is the 44th, with 16,671 persons; Spotland the 55th, with 9,031 persons; and Halifax the 58th, with 8,886 persons. This canal commences in Bridgewater's canal at Castle-Field in Manches-
ter, and terminates in the Calder and Hobbie navigation at the basin, wharves and warehouses at Sowerby bridge: to near Hollingwood chapel there is a branch of 4 of a mile, and another of 3 a mile to School-lane in Caldron near Rochdale. From Bridgewater’s canal to Piccadilly wharf, and the Manchester Africa and Oldham canal, 14 miles, has a rise of 754 feet; thence to the Hollingwood branch, 42 miles, has a rise of 84 feet; thence to Failsworth brook, 22 miles, is level; thence to the Rochdale branch, 43 miles, has a rise of 120 feet; thence along the summit-pound and through the deep-cutting to Travis-mill, 74, is level; thence to the Calder and Hobbie navigation, 11 1/2 miles, has a fall of 275 feet; the Hollingwood and Rochdale branches are level. From near Rochdale to Sowerby-Bridge there are 49 locks, (which are of the same width and length as Bridgewater’s at Runcorn,) more than 60 bridges and 8 aqueducts and large culverts. At Hallin’s mill is a tunnel of 70 yards in length, 17 feet high and 21 feet wide, with a towing-path through it. At Dean-Head, between Littleborough and Todmorden, is a stupendous deep-cutting in hard rock, some of it 90 feet deep. A very large reservoir is made on the west side of the summit, and an 100 horse steam-engine is used to pump the water up to the summit-pound. On a bog on Blackton edge are two other large reservoirs, one of them 14 yards deep. Gauges for regulating the tides of the Roch, Irwell and Irk rivers, so that their surpluses floodwaters are taken for the supply of this canal, were contrived and erected by Mr. John Renais, the engineer. Steam-engines within 20 yards of the canal are allowed to condense by its water. On the 28th of December 1798, the east end of the line from Sowerby bridge to Rochdale was completed; on 9th September 1802, it was continued to Lomelfide wharf; and on 21st December 1804, the whole line was completed and opened to Manchester. This company are to pay a compensation to the duke of Bridgewater for his warehouses at Castle-Field, and to the Calder and Hobbie company for their warehouses at Sowerby bridge. This company were authorized by their first act to raise 391,000l. (the amount of shares 100l. each) and by the last act they were authorized to raise a large sum in addition. The rates of tonnage and wharfage, and the exemptions in the first act, will be found in Phillips’s 4to. History, pages 157 and 159, to 161; also, by the second act, certain additions were made to these tolls. Cuts or rails-ways may be made to any present or future coal-mines near the line. In 1791 a branch from this canal was proposed from near Todmorden (104 feet below the summit-level) to 2 miles beyond Colne, having a tunnel thereon of 1/2 mile in length, about 3 miles N. E. of Todmorden.

**Rother River.** The general direction of this river is nearly N.W. by a crooked course of about 19 miles in the counties of Suffex and Kent; it is but little elevated above the sea in any part; its objects are the import of coal, &c. and the export of oak-timber and agricultural products: near Tenden are considerable towns on or near to this navigation; which commences in the tide-way of the English Channel near Rye old harbour, and terminates at Robertsbridge; it has a branch of about 4 1/2 miles to Winchelsea bridge, and some other navigable branches in the level fens which surround Oxney Island, and adjoin Romney-marsh. The harbour of Rye near the mouth of this river, from its tendency to choke up, formerly employed the abilities of captain John Perry, Mr. John Smeaton, and other eminent engineers; and under the acts of 29 Geo. I. and 1, 37, and 41 of Geo. III. several works have been constructed. Previous to the reign of Edward I., it is said, that the Rother vented its waters into the sea at old Romney harbour, about which time a new channel was cut for it to sea at old Rye-harbour, which for a long time favoured itself out, and was deep enough for the use of large vessels, the tide flowing 24 miles up the river; but failures being afterwards erected in improper situations, and embankments made, which (before 1659) the channel became too shallow for ships, and in 1719 it was rendered quite useless for navigation; soon after 1721, the flue above mentioned were removed, but the evil was become so irreparable, that captain Perry advised, and effected the cutting of an entire new channel of about a mile in length, 150 feet wide at top, and 70 at bottom, since called the new harbour (from the sea, near 2 miles west of the old harbour) into the channel of the Winchelsea river, and through that to the Rother and old harbour at Rye; this new canal (finished 14th July 1762) had about its middle part, a flue fluce of two openings, one for the passage of vessels, and the tide near high-water, 40 feet wide, shut by double gates pointing to Landward, and another of 30 feet wide, closed by 5 draw-gates, to be occasionally opened for fowering the mouth of the new channel or harbour, at which there were two stone piers erected at 120 feet apart. The upland and tide waters continued to have their course to sea by the old channel or harbour, and Mr. Smeaton who was consulted in 1753, confidently foretold, that unless the old channel was closed up near Rye, below the entrance to the new one, so as to turn the upland waters through the new harbour, it would be in time quite filled up, as happened to completely previous to 1757, that an act then passed repealing all the former acts relating to this new harbour, and the tonnage which coasting vessels had paid since it was established, on passing or entering the same, was transferred to Ramsgate harbour, near Stour river, into which such ships are able to run for shelter, in case of a storm coming on. The new Rye-harbour was in consequence blocked up, by a bank below the Winchelsea river, over which the new road between Winchelsea and Rye now passes: soon after this, the Rev. Daniel Pope revived the ideas of Meffrs. Perry and Smeaton, with regard to the entrance of the old harbour, and by the assent of Mr. Souterden, cut a new channel, or sea vent, for the river, about 4 of a mile west of the old harbour’s mouth, and being about 4 of a mile in length, before it interfected the old harbour: at this place Mr. Pope constructed a dam of flaw, faggots, and gravel, which effectually blocked up the old harbour’s entrance, and forced the tide to enter and return, and the river waters to vent themselves through his new cut (as Mr. Smeaton had in vain before recommended to be done with Mr. Perry’s new cut.) After which, Mr. Sutherland constructed a pier-head on the east side, and two jetties on the west side of the present entrance to the harbour, which is now said (see Translations of the Society of Arts, vol. xxii. p. 219) to be capable of admitting ships of 250 and 300 tons burthen at spring tides, which here rise 23 feet, and the ebb tides 14 feet. In December 1799, it was proposed to improve the navigation of this river between Rye and Robertsbridge, to extend the navigation of the Winchelsea branch to Siddlescombe, and to make a new navigable branch from Blackwall to Smallhite near Tenterden. In April 1802, this last branch was proposed to be joined by the intended Medway and Rother canal.

**Sandbach Canal.** In the year 1793, a canal was proposed to be made from the Severn river below Shrewsbury to the Trent and Mersey canal at Sandbach, with a cut to Betley, and another to join the Chester canal near Nantwich. The Tarbridge and Winsford, and the Newport and Stone canals, have
have at different times been proposed through parts of the
same tract of country.

Sankey Canal. Acts 28 of Geo. II. and 1 of Geo. III.
—The general direction of this canal is nearly N.W. by S.
very bending a course, that it exceeds a semi-circle; its length
is 124 miles in the county of Lancaster; it is not very
greatly elevated in any part: its objects are the export of
coals and flates, and the supply and trade of St. Helens
and Newton, and the copper, glass, and other works near
them; near Sankey bridge it connects with, and is crossed by
the fide-cut made in 1784, for avoiding the floodings in the
Mersey between Warrington and Runcorn. Warrington is
the 43th British town, with a population of 15,367 per-
sons; Newton and St. Helens are also considerable towns
near, or on this canal; which commences in the Mersey and
Irwell navigation at Fiddlers-ferry, and terminates near
Sutton, on both sides. Near the mouth of Sankey brook
it has a short cut of about ½ of a mile, forming another
communication with the Mersey river; there is a branch of
about ½ of a mile to Penny bridge, and another of ½ of
a mile to Gerards bridge. From the Mersey to Sutton heath
is a rise of 78 feet, by 8.5 fide-locks, and 2 double
locks of 15 feet rife each. The highest spring tides rife
within about a foot of the level of the water at the first
lock. Vessels deeply laden were generally unable to pass
into or out of the Mersey for two or three days of high
tides before the Mersey cut above mentioned was made.
This canal is 48 feet wide and 57 feet deep in water; it
has 18 bridges, all of which are wooden swing-bridges, even
for the great turnpike road between Manchester and Liver-
pool. Between St. Helens and Sutton heath there is a
short tunnel; the canal is fed by a feeder from Sankeybrook,
and there are provisions for enabling the farmers near this
canal to irrigate therefrom, between the 10th of October
and 1st of May annually. Mr. John Lives was the engi-
neer, and has the honour of completing this, the first English
navigating canal, that was attempted: it was opened between
the Mersey and Gerards bridge in the year 1765. The sum
of money to be raised for the purposes of this canal is not
limited in the acts, as is done in all modern canal acts.
The proprietors are authorized to take 12d. per ton on all goods
which are navigated on any part of their canal, except lime-
flour, and materials and meares, which are charged 6d. per
ton. Typical quantities are: 60 tons of coal, 100 tons of
charcoal or coke, and 200 tons of slaves, are rated as a ton, and a
buffalo of coals is to be measured in a vessel 10½ inches diameter outside, and capable of con-
taining one buffalo and one quarter of water Winchester
measure. In June 1797, a loaded barge was rowed 20 miles
on this canal by a machine worked by a steam-engine on board
of the barge, as before mentioned.

Selby and Leeds. In 1769, Mr. James Bridgley surveyed
the line of a canal from the Ouse river at Selby to the Leeds
and Liverpool canal (near to the termination of the Aire
and Calder navigation) at Leeds: it was proposed to pass
Thorp dam, near to Thorp hall, Hambilton, Hallowham,
Burton-Salmon, (where a tunnel was intended,) near Fair-
burn, Newton, the Fire engines, and cross the Aire river,
by Thrwalt mill, Hunflet, and so on to Leeds, a course of
23 miles in length: the opposition of the Aire and Calder
company, who were in the reign of William III. indulged
with very high rates of tonnage, and some other persons,
proved fatal to this scheme when it came before parliament.

Severn River. Acts 19 Hen. VII., 23 Hen. VIII.
and 12 and 45 of Geo. III. —The general direction of this
noble river is nearly north, by a crooked and bending course
of about 174 miles, skirting the counties of Somerset,
Gloucester, Glamorgan, Monmouth, and Hereford, and
through the counties of Worcester, Salop, and Mont-go-
mary: commencing in the tide way in the Bridft Channel,
at Flat-Holm light-house, and terminating in the Montgo-
mery canal at Wellpool. Its northern end is considerably
elevated: the trade of various kinds is very immense on this
important river, and the many navigations which connect
therewith. At the lower layer it is joined by the Glamor-
ganfuye canal and Cardiff and Moseley-Tyddal railway; at
New Amherst by the Severn railway; at Neth by the
Wye river; (not far from its junction with Monmouths-
shire canal, and a branch of Sibsey railway; at King's Road
by the Bath Avon river; at Beecleby by the Wye river;
at Berks-Pill, Hetch-Crib, and at Gloucester by the Gla-
cester and Berkeley canal; at Framleigh by the Stroudwater
river and canal; at Gloucester, on each side of Alney Isle,
and at Liferham by the Hereford and Gloucester; at Plet-
cher's leap with Cornwall's canal; at Tewshbury by the
Stratford Avon; at Diglis by the Worcestershire and Birming-
am canal; at Shrewsbury by the Ouseford and Stour-
bridge canal; at Stourbridge by the Shropshire and Wor-
derford, and the Lenninger canals; at Coal-port and at Loa-
der-craif near Coalbrook-dale, by the Shropshire canal;
and at Shrewsbury by the W分成 and E111e8e5e8e8 canals. Bristol is the 7th British town
with a population of 68,645 persons; Shrewbury the 36th,
with 14,739 persons; Worcest the 40th, with 11,352 persons;
and Gloucester the 72nd, with 5,759 persons; Cardiff, New-
port, Chepston, Thornbury, Berkley, Newsham, Tewshbury,
Upton, Bewdley, Kidderminster, Bridge-North, Much-
Waxlock and WelfPool, are also considerable towns near to,
or upon this river. The falls which this river has in
particular places have been mentioned in a preceding part
of this article, as also a valuable experience of 11 years
continuance on the floods, droughts, and fruits which
affected its navigation; which is unaffiliated by any locks,
fide-cuts, weirs, or other obstructions, except the towing-paths,
which Mr. William Reynolds began between Coal port and
Coalbrook-dale, in consequence of an act, 12 of Geo. III.,
since renewed, for making a towing-path between Coal-
brook-dale and Bewdley bridge, and levying certain tolls
on goods navigated on that part of the river for defraying
the expenses of such path, which has been since completed;
and in 43 of Geo. III. a similar act for making a towing-
path between Bewdley bridge to the Worcester and Birmingham
canal at Diglis below Worcest, which is, we believe, also
completed. The trade of the middle parts of this river is
carried on by two forts of vessels, viz. barges 40 to 60 feet
long with a single mast and square sail, carrying from 20 to
40 tons, and trows with a main and top-mast about 80 feet
high, and square sails; these are 160 feet long and 16 to 20
feet in width, and carry 40 to 80 tons. Some years ago,
Mr. John Wilkinson introduced some barges made of cast
iron plates for navigating this river. In the 16 Geo. III.,
an act was obtained for erecting a cast-iron bridge of one arch
(the first ever erected: see our article Bridges) over this river
at Bowlsey or Madeley wood near Coalbrook-dale. The high
floods, in 1795, carried away a narrow and inconvenient stone
bridge that was at Buildwas, about 2 miles above Made-
ley wood, and in 1796, a new cast-iron bridge was erected
in its stead, as before desribed: by an act of the 17 Geo. III.,
a new stone bridge was erected over this river at Gloucester,
by which the navigation there was much improved. At
Shrewbury the very long and curving loop of the river is tun-
nelled through by a small arch for conveying water to several
mills at its junction again with the river. In the year 1765,
the Trembridge and Windford canal was proposed to join this
river at Trembridge; in 1785 the Stourbridge and Worce-
ter was proposed to join at Diglis; in 1793, the Sandbach, and
another.
another canal in opposition to the Ellesmere (called, in some maps, the Eastern Grand Trunk,) were proposed to join this river below Shrewsbury. In 1795, the Wellington and Leomin-
fler was intended to join at Wellpool; in 1797, the Bridgel and Gloucester was proposed to join, both at Gloucester and at Worcester, to this river; and, in 1801, the Severn and H'ye rail-way was proposed to join this river at Liddon.

In the year 1801, a line of rail-way was projected from the Severn river at Liddon, across the forest of Dean, connecting with the collieries thereon, and extending to the H'ye river at English Bicknor. At a meeting, on the 14th of June, 1802, the southern part of this design was relinquished, and the Dean-Forest rail-way was proposed in lieu of the other part.

Shannon River, (Ireland). The general direction of this famous river is nearly N. E. by a crooked course of more than 100 miles, between the counties of Kerry, Limerick, Clare, Tipperary, Galway, King's county, Meath, Longford, El-
phin, and Leitrim in Ireland. It commences in the Atlantic Ocean, at Loop-head, and terminates at Carrick on the Shannon, which is 65 miles above Banagher. It is joined by the Grand Canal at Tormainbury, and it also is joined by the Limerick canal. Limerick, Kilahow, Cloonfort, Leitrim, Carr, Longford, Roefcommon, Athlone, Portumney, Ne-
agh, Ailcaton, Clare-Abbey, &c. are considerable towns on or near to this river. About the year 1753, the improvement of the navigation on this river was attempted, by the erection of flues with gates on its stream, for damming up and making fall for the boats to pass through with.

The Irish parliament, at different periods, between 1753 and 1774, granted several sums of the public money, amounting to 39,160l. for the improvement of this navigation. It was not until about March 1804, that the upper part of the navigation on this river was completed.

Shorncliff and Rye Canal. Defence a'et 43 Geo. III. The general direction of this singular canal is nearly S.W. by a bending course of about 18 miles, through Romney marsh in the counties of Kent and Sussex. It is fo nearly level with the sea as to require no locks but the tide-locks at its extremities. Its objects, besides aiding the defence of this part of our coast, is the import of coals and sea-beach for road-making; the export of farming products, and improving the drainage of the marsh: Hythe, Rye, Appledores, and Folkstone are considerable towns near this line; which commences in the tide-way of the English channel at Shorncliff battery near Hythe, and terminates in the tide-way of the Rother river opposite Pleydon Height near Rye. This canal is of width and depth sufficient for vessels of 200 tons to navigate; it has a military road by its side, and is flanked throughout with batteries of great strength. This canal was projected by the royal military engineers, in the autumn of 1804; and in June last (1805) 3000 men were said to be em-
ployed thereon, and before now it is, we believe, completed.

Shrewsbury Canal. Aetz 33 Geo. III. The general direction of this canal is nearly E. by a crooked course of 173 miles in length, in the county of Salop: its easterm end is greatly elevated, and at no great distance from the grand-ridge on its western side; its objects are the export of coals from its easterm end, for the supply of Shrewsbury, and supplying the same with farming products, and the country with lime and manure; at Wombridge it is joined by the Ketley canal. Shrewsbury is the 56th British town, with 14,739 persons. This canal commences in Cuffe Föregete bailon, at the town of Shrewsbury, (near to the Ellesmere canal, with which it may be joined by mutual consent,) and terminates in the Shropshire canal above Wrockend-ridge, and near Oaken-gates. From Shrewsbury to Langdon,

near 12 miles, is level; thence to near Wombridge, 43 miles, is a rise of 70 feet, by locks; thence is an inclined plane of 75 feet rise, and near ¼ of a mile in length, to the Ketley canal; thence (along the part which was purchased by this company of Mr. William Reynolds for 543l. being half of what it cost) to the Shropshire canal, 1½ miles, is level. The locks on this canal are contrived in two divisions by doors, which draw up, out of a recess for them below the locks, so that a long narrow canal boat of the usual construction, or two or four smaller and narrow flat-bottomed boats adapted to the inclined-plane, can pass the same without unnecessary waste of water. Near Atcham is a tunnel of 970 yards in length, and 10 feet wide, which has a towing-path 3½ feet wide through it, constructed of wood, and supported on bearers from the wall, so as not to diminish the water-way. At Long is a long embankment and an aqueduct bridge, or rather trough of cast iron, over the Tern river, 62 yards long, and 16 feet above the level meadows, of which we have already given a description in this article; at Reddington are another embankment and a common aqueduct bridge, 21 feet above the surface of the Roden river, over which the canal passes, and at Pinley there are another embankment and aqueduct of less height and width than the former ones. At Wombridge there is a double inclined-
plane of 323 yards in length, and 75 feet perpendicular rise, one of which, empty or partly laden boats are drawn by the aid of a steam-engine, by the help of a loaded boat at the same time on the other, as we have before described.

Mr. Thomas Telford and Mr. William Reynolds were the engineers employed or consulted on the construction of the works on this canal. In March 1796, the Long aqueduct was finished; and in February 1797, the whole line was completed and opened. This company was authorized to raise 70,000l. the amount of each share being 100l. The rate of tonnage is 2d. per ton per mile on all goods, and 1d. per ton for passing the inclined-plane; manures, except lime, being exempt on the pounds, but not to pass the locks when the water is ¼ an inch under the lock-wards. The profits of this concern are not to exceed 3 per cent. on the capital, after which the toll on boats for passing the plane is to be first lowered or taken off. The act in providing for the purchase of 15 miles of Mr. Reynolds's Ketley canal as above, requires him to pay 2d. per ton per mile afterwards for navigating the same, as above. Less than 8 tons in a boat, except in returning, is to be paid for as such.

Shropshire Canal. Aetz 28 Geo. III. The general direction of this canal, or rather system of water-levels and inclined-planes, is nearly north, about 7½ miles, in the county of Salop: its northern end is greatly elevated, and at no great distance from the grand-ridge on its western side; its objects are the export of coals and iron, and the carrying up of lime-flour. It communicates near Oaken-Gates with the Shrewsbury canal; it has no large town near it. It commences in the Severn river at Coal-Port, (a new town established by the late excellent Mr. William Reynolds, whose rapidly increasing manufactories in the year 1800 employed 400 persons,) and terminates in the Donnington-Wood canal at Donnington-Wood. It has a branch from Southall Bank, which proceeds to Brierly Hill near Coalbrookdale (2½ miles), and thence is continued by an inclined plane and rail-
way below, to the Severn at Loads-Croft, near the Broseley iron bridge. There is also a short rain-way branch to Hor-
Hay iron works. At the Severn at Coal Port (formerly called Sheep-wash Meadow) there is a flood-lock, which rises sufficient to clear the highest floods in the river, parallel to which the canal proceeds on a level, ½ of a mile, to near Hay, where is an inclined plane of 350 yards long and 207 feet
feet perpendicular rise; thence to near Windmill Farm, 1/2 mile, is level canal, where is another inclined plane of 600 yards in length, and 126 feet perpendicular rise; thence to the Briery branch at Southall-Bank, 2/4 miles, is level canal; thence to the Shropshire canal, Oake-Woods, 1/2 mile, is level; thence to near Wrockwardine-Wood, 1/2 mile, is also level: at this place is a third inclined plane, of 320 yards in length and 220 feet perpendicular fall; thence to the Donnington-Wood canal, 100 yards, is level. The boats are shallow, and carry 5 tons. There are no locks on this canal, which is supplied with water by two small referrers which lie above the canal, and two others below its level, the water therefrom being pumped up by the beam engines belonging to the inclined planes; the waters which are lifted from the mines contribute also materially to the supply of the different lengths of canal. The three great inclined planes at Hay, Windmill, and Wrockwardine, have each a short inclined plane descending from their tops into the upper canals, upon which the boats, on a proper wheeled carriage, are dragged by the beam-engines, working the wheels, drums, and ropes, and are, by the alight of another boat, or the operation of a brake-wheel, let easily down the long plane, as has been particularly described already in this article. At Briery-Hill the cranes or iron baulks of lime-rock were drawn up, and the coals in boxes were let down through perpendicular shafts, 120 feet deep, by ropes winding on a drum above; but several years ago this plan was laid aside, and an inclined plane, similar to the three others above, except that it has no beam-engine, has been adopted, as before mentioned. Six boats have been passed down, and as many taken up, the Windmill plane of 600 yards long, in the course of 3 single hours; the beam-engine and 3 men only being employed. It is said that only 3d. is charged for letting down a loaded boat, and empty ones are returned gratis. Mr. William Reynolds and Mr. Henry Williams were the engineers; and the works were completed, and the canal opened in the year 1792; it is said to have cost only 47,500l. The rate of tonnage is 2d. per ton per mile on all goods. In the year 1797, the tolls produced a net profit of 6 per cent. on the capital.

SIRROWY RAILWAY.—Act 42 Geo. III. (for Monmouthshire canal).—The general direction of this railway or tram-road is nearly N.W., for about 28 miles, in the counties of Monmouth, and of Brecknock in South Wales: its northern end is much elevated: its object is the export of coals and iron from the rich mineral country through which it passes: at Court-by-bills farm, and at Rifa, it is joined by railway branches of the Monmouthshire canal. Newport is a considerable town near its southern extremity: it commences at the Uske river, near Pill-Gwenly (opposite the commencement of the Monmouthshire canal), and terminates at Trevil lime-rock quarries, in the parish of Llangumin; and it has a branch to Runney union iron works; the line passing through Sirrowy and Tredegar iron works, and through Tredegar park; it was laid also, that a branch of the railway was to be conducted from near Tredegar park to the meadows near the Severn river, where a new sea-port town, to be called New Amsterdam, was laid out and begun. This company were authorized to raise 45,000l., the amount of their shares being 100l., and they have engaged to pay 110l. annually to the Monmouthshire canal company, on condition of their constructing the first 9 miles of this tram-road nearest to Uske; sir Charles Morgan is to make a mile in length of the same through his park at Tredegar, and receive the tolls thereon; and, Meifrin Samuel Homfray, Richard Fotherghill, Matthew Monkhouse, William Thompson, William Forman, and other iron-masters, are also to contribute particular parts of this concern. It was provided, that if these several parties failed to execute their several parts of the line, previous to Michaelmas day 1803, that the sums for 9 as relates herein, should be void. A new turnpike road is made by the side of the railway for 21 miles: the ascent of the railway is so easy, that one horse can draw 10 tons down the line, and return with the empty trains. A new town was laid out and begun at Tredegar new iron works, near Shrewsbury.

SLEAFORD NAVIGATION. Act 32 Geo. III.—The general direction of this navigation is nearly W., for about 12 miles, in the county of Lincoln; it is but little elevated above the sea, the greater part of it being embanked on both sides through level tanks: its objects are the supply of Sleaford and the surrounding county with coals, deals, &c., and the export of farming produce. Tatterhall and Sleaford are considerable towns near this navigation. It commences in the old Witham river at Chapel-Hill (not far from the commencement of the Horncastle canal), and terminates at the castle-caulway near Sleaford. The locks are 60 feet long, and 15 feet wide in the clear; the width of the canal is 30 feet at top, 18 at bottom, and four feet deep, except the summit pound from Haverhill mill to Sleaford, which is to be 5 feet deep, to make a reserve of water, which is to be supplied from the tanks above the navigation in New Sleaford. This company was authorized to raise 25,000l., the amount of shares 100l. each. The tolls are various for different parts of the line. See Phillips's 440. History, Appendix, p. 26. Lime, marbles, and road-materials pay only half the rates of other articles. The profits of this concern are limited to 2 per cent. and after 100l. is accumulated as a fund for contingencies, the tolls are to be lowered. This company are to join with the Horncastle canal company, in the expense of improving the old Witham river between Lincoln high bridge and the Foss-dyke navigation at Brayford-Meer; in consequence of which only half the usual tolls on the old Witham are to be taken, or goods passing to or from these navigations.

SOMERSETSHIRE COAL CANAL. Acts 34, 36, and 42 Geo. III.—The general direction of this canal is nearly S.W., for about 10 miles, begins a principal branch of 7½ miles nearly parallel thereto, in the county of Somerset: its western ends are considerably elevated: its object is the export of coals from the mines near Mendip hills. Bath is the 12th British town, with a population of 32,000 persons, and Bradford the 7th, with 75,02 persons, which are the only large towns near this canal; which commences in the Kennet and Avon canal, at Monks-lane Coombe, and the main or Dunkerton line of canal terminates at Paulton, but a railway continues it forwards to Tynings; the Radflock line or branch of canal proceeds from the lat at Mitford mill, and terminates at Radflock town: but a railway continues it forwards to Welton colliery; there are also railway branches from this line to Radflock colliery, and to Smallcombe and Clifton collieries: from the main or Dunkerton line, there are railway branches to Mearns, Amelbury's, Britton's, Salisbury's, and Radflock collieries. From the Kennet and Avon canal to Mitford mill is level, thence the main or Dunkerton line rises.
The Cdnhls line runs about
the same height from Misford mill. The boats used are
72 feet long, and 7 feet wide. About July 1796, Mr. Robert
Wheeler began the erection of one of his diving or
cuflin locks at Coombe-Hay, for pafing the boats
through a perpendicular shaft, either in ascending or
descending. In November 1797, this apparatus was in suf-
cient forwardness for the caufen to be funk and raised again
in the shaft; and, in May 1798, a trial was made of this
contrivance, fo successful, that the inventor then offered to
undertake to pafs 1500 tons of goods in 12 hours through
this 45 feet rife or fall, without the loss of any considerable
quantity of water, and with the aflance of only one man.
besides the bargemen, to work the machinery. These fair
prospects were, however, blunted, by the bulging of the walls
of the shaft, as we have already mentioned, in describing
this contrivance; and inclined planes were constructed at
this place for letting down boxes full of coals, the decfent
of which, by means of ropes and wheels, drew up the boxes,
either empty, or in part loaded with other goods; the delay and expeance of this method being highly com-
plained of, about September 1802, a new infubcription
was fet on foot, and encouraged by the Kennet and Avon
and Wilts and Berks companies, for substituting locks, 22 of
which were completed, and opened on the 5th of April last
(1825). Mr. John Rennie, Mr. William Bennet, Mr. Charles
Wedge, and Mr. William Smith were the engineers consult-
ed or employed upon this company, which, in January 1801,
was completed from Dunkerton to several of the coal mines,
and which, (after 4 miles of land carriage,) had the efiet
of lowering coals at Bath from 14d. or 15d. per ewt. to 9d.
or 1Od. This company was authorized to raise 185,000l.,
the amount of shares 100l. each. Before undertaking any
of the rail-way branches to the collieries, this company might
require fecurity from the owners of such collieries, that
the tolls thereon should produce, or be made up, to a certain
rate of inereft on the coat of such branches. The profts
of this concern are not to exceed 10 per cent.; but after
1000l. is accumulated and placed in governinent fecurities, as
a fund for contingencies, the tolls on coals are to be lowered.
Husbandry and pleafure boats 12 feet long and 5 feet wide
may be paffed free on the pounds, or where the water
flows waft over the lock-weirs. A tunnel, 3 of a mile
long, was at firft paffed near Coombe-Hay, but by a fah-
quent alteration of the line this was avoided. The rates of
tonnage in the firft act may be seen in Philip's 4to.
Hilfury, App. p. 16; and 164, including, the tolls on horses,
cattle, sheep, &c. travelling on the rail-ways; by the laf-
tome of the tolls were increased. Dunkerton mill was
purchased by this company, and fleam-engines were erectioned
to pump up water for supplying the upper pounds. In se-
veral places this canal was cut through flrete defpofed to flip,
but by the small tunnels or foughs which Mr. William Smith
conftucted, for draining off the springs, the fame was
prevented. On the 3d of May, 1804, a sudden and great
flood happened, which required, it was said, some of the
banks of this canal to be cut in proper places, to give vent
to the water.

Southampton and Salisbury Canal. Acts 35 and
40 of Geo. III.—The general direftion of this canal
is nearly N.W. for about 17 miles, in two detached lengths, in
the counties of Hants and Wilts; it is not greatly elevated;
is objects are the trade between Southampton and Salibury,
the supply of thefe towns, and the eport of the furnifs
farming products of the intermediate country. This canal
commences in the Itchen river, at Northam near Southampton,
and proceeds along the N. E. shore of Southampton water
to the Alverbay canal at Red-bridge. In the Alverbay canal
(about 31 miles above Red-bridge), near Kimbridg mill,
this canal commences again, and proceeds to the Avon river
at Salisbury, or New Sarum. Southampton is the 63th
British town, with a population of 7,312 persons, and
Salisbury is the 70th, with 7,468 persons; Romsey is
also a confiderable town near this line. The eafier part
of this canal, between Northam and Red-bridge is level,
and but little elevated by its tide-locks, above the tide-way
in Itchen river and Southampton Water; from its flifting along
clofe to the shore of the latter river, it was that that facing
ftrahit Peter Pindar took occasion to burdlefque "Southam-
pton's wife fons." Upon this part of the canal there is a
tunnel of confiderable length clofe to, and indeed under part
of the north end of Salisbury town; confiderable difficulties
feem to have attended the making of this tunnel, owing to
the loofenefs of the foil; and the quick-fands at the foot of
the cliff, by the ifle of Southampton Water, have also proved
a very feros obstacle. An aqueduct is built over Shirley
Brook; springs within 1000 yards of the canal may be
taken for its fuiply, which is alfo to be aided by lame refer-
voirs, which were begun in 1796. This company have been
authorized to raife 96,000l., the amount of each share being
100l. Mr. John Rennie is the engineer; the eafier part
of the canal was begun in 1796, and was laid, in 1803, to
be nearly done, but it is not yet opened. The western part from
the Alverbay canal at Kimbridge was completed to Dene, in
October 1798. Stones are to be erected on the banks of this
canal, at every 3 of a mile distance.

Southampton Water. Acts 12 Henry VII. and 18
Henry VIII.—This noble efuary of the Anton and other
rivers has a N.W. direftion for about 10 miles in Hamp-
shire. The tide flows through its whole length, and through
a branch thereof more than 5 miles in length to near
Botley; Southampton water is navigable for large ships;
it commences in the channel between Hampshire and the
life of Wight at Calshot Canle, and terminates near
Red-bridge where it is joined by the Anton river (formerly
navigable near 6 miles to Romsey), and the Alverbay canal
near one of the terminations of the Southampton and Salis-
bury canal; near Salisbury it is joined by the Itchen river,
(about 2 of a mile from the commencement of the Southampton
and Salisbury canal). In the 4th of Geo. III., an act
passed for enlarging and improving the quay and harbour of
Southampton, by building a pier and other works which
commenced in December 1803, and have since been pro-
ceeding.

Staffordshire and Worcestershire Canal. Acts
6, 12, and 30, of Geo. III.—The general direftion of this
canal (sometimes called the Wolverhampton canal) is nearly
north for 464 miles in the countries of Worcefter and Staf-
ford; its middle part is very confiderably elevated, and it
croffes the grand-ridge without a tunnel; its trade in
the export of coals, pottery-wares, hard-wares, &c. is
immense, befoes the general trade between the Severn, the
Mersey, and Trent, which for a long time passed exclufively
through it. Near to Stourton, and to Stewponey, it is
joined by the Stewbridge canal, and at Alderley or Ather-
ley by the Old Birmingham canal. Wolverhampton is the
3rd British town with 12,565 inhabitants, and Kiddermin-
ster is the 95th with 6,110 persons; Bewdley, Stourbridge,
Penkridge, and Stafford, are also confiderable towns on or
near to this canal; which commences in the Severn river at
Stourport, and terminates in the Trent and Mersey canal at
part Haywood. From the Severn river at Stourport, to
the Stewbridge canal at Stewponey, 1 1-2 miles, is a rife of
1274 feet by 13 locks; thence to Tettenhall, the beginning of
of the summit-pound, 17 miles, is a rise of $166\frac{1}{2}$ feet by 18 locks; thence to the tidal Birmingham canal, 1/2 mile, is level; thence to Street-way, 83 miles, is level to the N. end of the summit-pound; thence to the Trent and Mersey canal at Haywood, 134 miles, is a fall of $100\frac{1}{2}$ feet by 13 locks. This canal is 30 feet wide at top, and 5 feet deep, through the depth of water on the lock-fills is only 4 feet. The locks are 74 feet long and 7 feet wide; and several of them are built of a red kind of free-stone; the boats in general carry 20 tons. At Stourport are two basins belonging to this canal connected with the Severn river by flood-locks to keep the water in them always at one certain height. On this canal are three short tunnels; one is near to Stewponey, the other at Whittington, and the other is an arrowed-way under part of the town of Kidderminster; at which place there is an aqueduct-bridge over the Stour river, another at Prestwood on Woldsey brook, another near Milford on the Sow river, and another at Haywood mill over the Trent river. In Chillingham is a large reservoir, and at Mofley another, whose waters are conveyed to the summit-pound by feeders of considerable length. This company may make branches to any place within 1000 yards of the line by consent of the land-owners. Mr. James Brindley was the engineer to this canal, which he began in September 1766, and finished in 1772. The first lock which this engineer erected was at Crompton, on this canal. This company were authorised to raise 100,000l., the amount of each share being 100l. In September last (1805), the yearly dividend on these was flatted to be 2d. The rates of tonnage are flat (in Mr. John Cary's excellent work with maps, now publishing in numbers, on Inland Navigation,) to be $12d$. per ton (24c. lb.) per mile on all kinds of articles except lime and lime-stone, which pay only $4d.$ per ton; and paving and road materials, and manures for adjoining lands which are to pass toll free on the pound, and through the locks when the water flows over the lock-waers. By the Dudley act (16 Geo. III.), coals brought from that canal and carried on this may be charged $2d.$ per ton per mile, but commissioners may authorise lowering this toll. The usual charge made by bargemen in 1796 for freight (including the company's tonnage) was, for perishable goods $24d.$ per ton per mile, and for heavy unperishable goods 2d. In 1802, a tunnel 5 feet in diameter and 135 feet long, composed of cylinders of calf-iron, was laid under the river Penk near this canal for draining a morass of 500 acres. In the last feftions (45 Geo. III.) application was made by this company for a new act, to raise the tolls in order to make new locks, the old ones in some places being decayed and nearly worn out, and for making some new rail-way branches. The Stour river between Stourport and Stourton, by the side of this canal, was made navigable several years ago, but the works thereon were soon after destroyed by a great flood. In the present month (November 1805), a rail-way branch from Latherford in Sharehill is projected, to Mr. Henry Vernon's collieries in Bultbury.

**Stainton and Keaby Canal.** Acts 33 and 38 of Geo. III. The general direction of this canal is nearly W.; for 15 miles in the counties of Lincoln and York, it has its course through level farms and is but little elevated above the level of the sea; its objects are the import of coals and export of agricultural produce, with a better drainage of the country through which it passes. Thorne is the only considerable town near this line; which commences in the Trent river at Keaby, and terminates in the Don river at Fifihlake near Stainton, having also a branch 1 mile in length which joins the Don river at Hangman-Hill in Thorne; the whole is on one level, having tide or flood-locks at its extremities to regulate its height notwithstanding the variable tides and floods in the adjoining rivers. A reversion of 5 acres is conferred on Thorne Common, and the waste water from this canal is to be discharged into the Trent. In 1762, when Mr. John Smeaton was consulted about the drainage of Pottick Car, a navigable canal through these fens was in contemplation. This company were authorised to raise 54,200l., the amount of shares being 100l. each.

**Stoke River.** The direction of this river (sometimes called the Winfon) is W. for about 83 miles in the county of Norfolk; it is embanked nearly its whole length through the fens, and is but very little above the sea; its objects are the import of coals, deals, &c. and the export of agricultural products. Downham is the only considerable town near it; it commences in the Great Ouse river between Denvers-fluce and Salters-Load, and terminates at Stoke-Ferry near the town of Stoke.

**Stort River.** The general direction of this river is almost N.E. by a bending course of about 13 miles between the counties of Essex and Hertford; its northern extremity is considerably elevated; its objects are the import of coals, deals, &c. and the export of farming products. Hoddleston and Bishopstortford are considerable towns near this river; which commences in the Lea river near Hoddleston, and terminates at Bishopstortford. In 1785, this navigation was proposed to be joined at its northern end by the Bishopstortford and Cambridge, and in 1789, it was intended to join the Bishopstortford and Wilton at the same place.

**Stour River (Chriftchurch.)** The direction of this river is nearly N.W. for about 35 miles in the counties of Hants and Dorset; its northern end is considerably elevated; its objects are the import of coals, deals, &c. and the export of farming products; Chriftchurch, Wimborn-Minster, Blandford-Forum, and Malmesbury-Newton, are considerable towns on this river; which commences in the tide-way in Chriftchurch-bay at Chriftchurch-harbour, and terminates at Stourminster. At Ames-crofs in Shillingbrook-Oxford, it is to be joined by the Dorset and Somerfruit canal. In 1762, Mr. John Smeaton was consulted on the intended improvements in Chriftchurch-harbour; the spring-tides in this harbour flow only 5 to 7 feet, and the neap-tides no more than 4 to 6 feet; and 3 hours after high water there is a second or smaller tide, which flows in the harbour from 8 to 18 inches, being greatest at the neap-tides. In the reign of Charles II., a pier of 256 yards in length, was constructed of lumps of iron-stone out of the loofe sandy-cliff near it, and Mr. Smeaton, in 1704, planned another pier to be built for the better security of this harbour.

**Stour River (Harwich.)** The general direction of this river is nearly W. by a bending course for about 29 miles between the counties of Essex and Suffox; the first 10 miles is a wide effuary through which the tide flows, the western end is not greatly elevated; its objects are the import of coals, deals, &c. and the export of farming products; Harwich, Manningtree, Neword, and Sudbury, are considerable towns on this river; which commences in the Sewmarket and Ipswich navigation (near its junction with the German Ocean) at Harwich, and terminates at Sudbury.

**Stour River (Sandwich.)** Act 7 Henry VII.—The general direction of this river is nearly W. by a crooked course of about 18 miles in the county of Kent, it is but little elevated above the sea in any part; its objects are the supply and trade of Canterbury, and the export of farming products. Canterbury is the 57th British town with a population of 9,000 persons, and Sandwich is the 93d with 6,556 persons. Ramsgate is also a considerable place near to this river; which commences in the English Channel or

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Downs at Sandwich Haven (1½ mile from Ramsgate-harbour), and terminates at the city of Canterbury; the lower end of this river, for 1½ mile in Pegwell bay, has its course through shifting sands which are dry at low water, and covered at high water; it is therefore unsuited for large vessels to enter, and Ramsgate harbour is the only secure retreat for ships in case of a storm on this part of the coast. The celebrated piers which form this harbour were begun in 1749; the southern pier extends 800 feet eastward into the sea, it then returns northward, forming the front next the Downs, by a polygon of 5 sides, each 430 feet in length; these are joined at their angles by octagons of solid masonry that are 60 feet across; the breadth of the pier at top including the parapet is 26 feet, and the whole is built of hewn Portland and Purbeck stone. The entrance for ships is from the north nearly, and is 200 feet wide; having a light-house with Argand’s reflecting lamp on its west side, and this is connected with the shore by a small, though short pier, as on the southern side. The area of the famous harbour, thus formed in the open sea, is 46 acres, and it is deep enough to receive ships of 4 or 500 tons burthen. A spacious dry-dock for the repair of ships connects with this harbour. In a few years after the piers were completed, this harbour was nearly choked with mud deposited by the tides. Mr. John Sneaton, who was consulted, erected a cross-wall at the uppermost extremity of the harbour with numerous sluices therein, by the drawing of which, after the tide has retired and left this refuervor full of water, the mud has been since effectually cleared out; this excellent engineer also extended the pier 420 feet at the head. Nearly 300 ships have been known at once to assemble in this harbour for shelter on the approach of a storm. An act 5 Geo. III., passed for improving this harbour as above, and by 27 Geo. III. the tonnage charged on vessels passing the English Channel for the support of Rye-harbour, was transferred to this harbour as before mentioned. In the year 1834, the Canterbury and Nethersole canal was intended to join the Stour river at Canterbury; and in 1804, the Medway and Rother canal was proposed to join it near the same place.

Stour River (Stourbridge). Many years ago the Stour river from the Severn at Stour-port to the town of Stourbridge, (passing the town of Kidderminster,) about 14 miles, was made navigable by means of sluices, weirs, and other works; but soon after it happened so sudden and violent a flood as to destroy all these works. The Stafford and Worcester, and the Stourbridge canals, have since fulfilled more effectually the place of this river navigation.

Stourbridge Canal. Acts 16 and 22 of Geo. III. The general direction of this canal is nearly E. by a crooked course of about 5 miles in the county of Stafford; its eastern end is considerably elevated, and extends within about 3 miles of the grand-ridge on its eastern side; its objects are the export of coals, non-clay, &c. and forming part of the communication between the Old Birmingham and the Severn, &c. Stourbridge and Dudley are considerable towns near this line; which commences in the Staffordshire and Worcestershire canal near Stourton and Stourpenny, and terminates in the Dudley canal at Black-Delph; there is a branch of near 1 mile to the town of Stourbridge, and a branch of 2 miles to Penfnett-Chafe refuervor, with a side-branch thereto of near ½ of a mile in Brierly parish. From the Stafford and Worcs- easter canal to near Stewpenny, ½ of a mile, is a rife of 432 feet by 4 locks; thence to the Stourbridge branch, 2 miles, is level; thence to the Lays, ½ mile, has a rife of 148 feet by 16 locks; thence to the Dudley canal, ½ mile, is level; the Penfnett and Brierly branches are level with the last or summit-pound, and the Stourbridge branch is level. The width of this canal is 28 feet, and the depth of water 5 feet. The Penfnett-Chafe or Pen overthrow is 12 acres in extent, for supplying the head-level of this canal. This company were at first authorized to raise 50,000l. in 100l. shares; the last act authorized calling upon the subscribers for 7,500l. more, by which their shares are now increased to 10,128 each. The rates of tonnage will be found in Mr. John Cary’s Inland Navigation, pages 50 and 51. Goods may be navigated on the summit-level toll free; and road-materials and manures for adjoining lands, may also be carried on any of the ponds toll free. Less than 15 tons are not to pass any lock without concert. Side-branches may be made to the adjacent collieries. The Worcestershire and Birmingham company were bound (act 31 Geo. III.) to make up the profits of this concern to ½ per cent on per annum, in case of their canal not reaching the trade-accounts, but on the extention of the Dudley canal to join the Worcutter and Birmingham, the last mentioned company were exonerated therefrom, and the Dudley engaged (33 Geo. III.) to make up the annual dividend on the shares in this concern to 121 each; but not to exceed 31, and this when their own canal yielded a dividend of 5l. per share. The part of this canal below Stourbridge supplies the place of the river Stour navigation, which was directed by floods as above mentioned. In 1786, the Stourbridge and Worcester was proposed to join this canal at Stourbridge; as was also a branch since proposed from the Worcester and Birmingham. Stourbridge and Worcester. In 1786, a canal was proposed, and supported by the late lord Dudley and Ward, from the Severn river at Diglis below Worcester city to the Stourbridge canal at that place, palling Bromigrove; its proposed length was 26 miles with 772 feet of lockage, by 128 locks; some tunnels and other large works were neces- sary; a bill for this canal palled the commons, but was rejected by the house of lords.

Stowmarket and Ipswich Navigation. Acts 33 and 45 Geo. III.—The general direction of this canal is nearly N.W. for 6½ miles in the county of Devon; it is but little elevated; its objects are the import of coals, chiefly sea-fish and lime, as manures, and the export of potters’ clay (used in Staffordshire, Lancashire, &c.), and a peculiar kind of imperfect coal found in small quantities at Bovey-Tracey; Newton-Butt and Chudleigh are con- siderable towns near this canal, which commences in the tide-way in the Teign river at Newton Abbots, and terminates at Bovey-Tracey, with a branch of 2½ miles to the town of Chudleigh. From Newton-Abbots to Newton-Butt, 1 mile, is a rife of 20 feet; thence to Bovey, 5½ miles, is 30 feet rifle; the Chudleigh brand is level. James Templar, Esq., is the sole proprietor of this canal, and Mr. Gray was his engineer. At Teigngrace, and the adjoining parishes, the surplus water of this canal has been applied to the irrigating of the lands below it, a capital improvement, which we are very anxious to see more generally adopted. Stowmarket and Bury Railway. In December, 1802, it was in contemplation to make a rail-way from the Stowmarket and Ipswich navigation at Stowmarket, to the Lark river at Bury St. Edmonds, for the purpose of supplying the latter place, and the intermediate country with coals; (the Lark navigation being often interrupted by droughts in the autumn;) and for the reader export of farming. Stowmarket and Ipswich Navigation. Acts 33 and 45 Geo. III.—The general direction of this navigation (which follows the course of the Orwell river) is nearly N.W. for about 26 miles, in the county of Suffolk, the first 13 miles, to near Ipswich, being a wide channel or estuary, in the tide-way, the remainder is not greatly elevated; its objects are the import of coals, deals, &c. and the export of farming.
farming products; it is joined by the Stear river near Harwich. Ipswich is the 4th British town, with a population of 13,327 persons. Harwich, Needham, and Stowmarket are also considerable towns near this navigation; which commences in the German ocean at Landguard fort, and terminates at the town of Stowmarket. This company were, by an act prior to the above, authorized to raise 150,000l. more than already raised; the last act was for improving the port of Ipswich by deepening the same, so that ships might unload at the wharfs, &c. In December, 1802, it was proposed that the Stowmarket and Bury railway should join this navigation at Stowmarket.

**Stowmarket Canal.** Acts 32, 37, and 39 Geo. III.—The general direction of this canal is nearly N. for 2.1 miles, in the counties of Warwick and Worcesters; it is very considerably elevated, and crosses the grand ridge; its objects are the export of coal, lime, and paving-stones; and as a link in the great chain of canal communication; at Kingwood in Rowington a branch of this canal connects with the Warwick and Birmingham; Stratford upon Avon and Henley are considerable towns on or near this canal, which commences in or near the Avon river at Stratford, and terminates in the Worchester and Birmingham canal at King’s Norton, about 6 miles from Birmingham. From near Hockley there is a branch of 2.4 miles long to Tanworth quarries; from near Lapworth there is another branch of 1.5 miles to the Worchester and Birmingham canal; and from near Wilmcote is a branch of 4 miles to Temple-Grafton lime-works; with a branch of about 1 mile from this cut to Alston-Cantelow. From Stratford to near Copnas-hill, 1.2 mile, is level; thence to Wilmcote, 1 mile, is a rise of 86 feet; thence to Pretonmill, 6 miles, is level; thence to Preton-green, 1.3 mile, is a rise of 76 feet; thence to Lapworth-hall, 1 mile, is level; thence to Hockley Heath, 2.5 miles, is a rise of 147 feet; and thence to the Worchester and Birmingham canal, 10 miles, is level; the Tanworth branch is level, and connects with the summit-pound; the Temple-Grafton cut is level for the first 2.4 miles, and in the next 1.5 mile the rise is 200 feet. Near Milepole hill is a tunnel of 320 yards in length; there are several small aqueduct bridges; and some deep-cutting near Waring’s Green. In May 1766 the summit-level of this canal from the Worchester and Birmingham canal to Hockley-heath was completed and opened. This company was authorized to raise 250,000l. the amount of shares 100l. The rates of tonnage and exemptions are very long; see Phillips’s 410. History, Appendix, p. 111 and 112. At the junction with the Worchester and Birmingham canal; this canal and the Worchester and Birmingham canal cut-off bridges are to be erected, to be shut and locked by either company, when the supplies of the other canal fail in dry seasons; with the Dudley and Worchester and Birmingham canals there are a number of regulations as to tonnage, in the second act above (37 Geo. III.). About the year 1792 the Strapford and Groperley canal was proposed to join this at Stratford.

**Strapford and Groperley.** About the year 1792 a canal was proposed to connect with the Avon river and Strapford canal at Stratford, and proceed to the Oxford canal at Groperley, by a course of about 31 miles in length; this being the southern part of the proposed line between Dudley and Groperley; the northern part thereof being since occupied by the Strapford and the Dudley canals.

**Strowwater Canal.** Acts 34 Geo. II. 15 Geo. III. 23 (for Thanes and Severn, and 33 and 37 Geo. III. (for Gloucester and Berkeley).—The general direction of this canal is about E. for 8 miles, (following nearly the course of Strowwater river,) in the county of Gloucester; it is not greatly elevated; its objects are the import of coals, and forming part of the first direct communication between the Seven and Thames and Isis rivers; at Wheatshead, the Gloucester and Berkeley canal crosses and connects herewith. Strond is the 114th British town, with a population of 5427 persons. This canal commences in the Severn river at Flameham, and terminates in the Thames and Severn canal at Wallbridge near Strond; from the Severn to the Thames and Severn, there being a rise of 10 feet; this canal is wide enough for the Severn river boats. The engineers were Mr. Thomas Yorston and Mr. Robert Whitworth. The first of the above acts was for powers to raise 200,000l. in 200l. shares, intending to execute the works under the powers of an act of 3 Geo. II. for improving the Strond canal. However, but several expensive lawsuits put a stop to the works, as we have already mentioned, until the second act was obtained; a double lock of 14 feet rise on this canal had a slipping bank of earth 10 feet high by its side, and gave immediate trouble, to prevent the walls thereof being bulged in, this was at last accomplished by the turning of two dry drains of four feet diameter, between the lock and the bank. In 1802 the dividends on shares in this concern were 6l. each, and their price was about 135l. This canal has no horiz towing-path, but slips are erected thereon, and the barges are hauled by men. Where this canal crosses the Gloucester and Berkeley, lock-gates are to be erected to prevent this canal from losing its water; no dues are to be taken for vessels crossing either of these canals. If, while the Gloucester and Berkeley is cutting, the navigation of this canal is interrupted, five guineas per day are to be paid to this company; vessels passing to or from the Berkeley and Gloucester canal and this, are to pay the same tonnage as to and from the Severn at Flamham. This company are authorized to take 25, 37. per ton for coals which pass through this canal, and on the Thames and Severn canals, but not beyond Binfcomb bridge thereon, and for such coals as pass eallway of Binfcomb bridge, 18. per ton.

**Strawwater River.** The act of 2 Geo. II. passed for making this river navigable between the Severn and the town of Strond, a distance of about 8 miles, as above; but the opposition of the millers and others prevented its being accomplished, until 34 Geo. II. when Mr. Bridge undertook to construct the navigation, without waifs of water or prejudice to the mills, by means of canals to hoist the goods in boxes out of the boats in one pound, and place them in others in the adjoining pounds, as we have before described; but this scheme miscarried, and the projectors were nearly ruined; at length the Strawwater canal was constructed by the side of this river as above.

**Surrey Iron Railway, (Northern part.)** Acts 41 and 45 Geo. III.—This, the first public railway constructed near the metropolis, has about a S.E. direction, for 10 miles, in the county of Surrey: its southern end has a considerable elevation: its objects are the import of coals and manures, and the export of chalk, flint, fire-clay, fullers-earth, and agricultural products. Croydon is the 188th British town, with a population of 573 persons; Wallsworth is also a considerable town on this line; which commences near the tidal-river of the river Thames at Wandelworth, and terminates at the turnpike house S. of Croydon, in the southern part of the Surrey iron-rail-way; at the N.W. extremity of Croydon the line of this rail way is but about 5 miles from the Croydon canal; from Mitcham common a branch goes off for about 1.5 miles to Mr. Shipley’s skinning mill at Carhallow; and, to Meffra. Were and Barfo’s oil-mill, about 4 miles, there is another branch at Garrant-lane. This rail-way has nowhere a greater ascent than about 1 inch in 10 feet; it is double throughout, with numerous crossing places for the carriage out of one road or track into the other,
other; of these we have already given a particular account, as alfo of the contrivances for diflounging the contents of the rail-
way waggons, on fome occasions, into barges lying in the en-
trance bafon at Wandsworth, which is about 4 ft. of mile long,
with a lock next the Thames, and is spacious enough to hold
30 barges or more at once, feveral of which can be along the
wharf to load or unload at the fame time. The width of each
track is about 4 ft. 6 in., the waggons carry about 34 tons each,
and feveral of them are often linked together to be drawn by
one horse. This rail-way crofles the Wandle river twice on
wooden bridges. On the 9th of January, 1802, the entrance
bafon at Wandsworth was opened and opened; in October
of the fame year, the rail-way from the fide thereof crofing
the turnpike road, and extending to Garratt was completed,
and in the courfe of the prefent year it was opened to Croy-
don. The company were, by the firft act, to
raife 50,000l. and a further sum, by the act of the late
fessions, the amount of 100l. Few fubjefts have been
more variably flated than the cofl per mile of this rail-way.
Mr. John Phillips, after noticing in his History the com-
 mencement of this work, adds, that iron rail-ways are made
at an expense of about 300l. per mile. The original estimate
was, we believe, 200l. per mile; at a public meeting at
Gosport, in September 1803, it was flated by fome favour-
ers of the extension of a canal from Croydon to Portsmouth,
that the expenditure on this rail-way had amounted to 64,000l.
per mile; but the advocates for extending this rail-way to
Portsmouth instead of a canal, then contended that the ex-
 pense did not exceed 4,500l. per mile; while Mr. James
Malcolm, in his Agricultural Report on Surrey, juft pub-
lished, after flating the great pains he had been at to come
at the facts, fays, "inland, therefore, of the expense being
200l. per mile, it appears as if it would be 700l.!!" (this
includes all the expenditure of the company). The rates
of tonnage are from 2d. to 6d. per ton, per mile, for dif-
ferent goods; and owners of adjoining lands may use the
rail-way for a drift road. Ten pounds annually are to be paid
to the city of London by this company, for connecting with
the river Thames.

SURREY IRON RAIL-WAY (Southern part). Act 43
Geo. III.—The general direction of this line of rail-way is
nearly S. by a bending course of about 16 miles, in the
county of Surrey; upon the chalk-hills or North Downs,
it is greatly elevated; its objects are the import of coals and
manures, and the export of chalk, lime, fire-flone, free-
flone, flints, fullers'-earth, and agricultural products. Croy-
don is the 10th British town, with a population of 5,743
persons; Ryegate and Godflone are also conderable towns
on or near this line, which commences in the northern part
of the Surrey iron rail-way at Croydon turnpike, near the
fouthern end of that town, and terminates at Godflone,
paffing near to the towns of Mertham and Ryegate in its
courfe. It has a rife or fall of 1 inch in 10 feet, in crofing
the Downs; near to Mertham is a conderable length of
cutting 30 feet deep in fome places, in order to obtain the
proper defcent; at Smitham-bottom is 130 feet high, across a
valley, for the fame purpofe, with a road-arch under it; it
crofles the Croydon and Mertham road in another place by an
arch, and the road is funk conderably in order that the rail-way with its proper
defcent may pass over it. The width of this double rail-way,
including a path on each fide for the carriage drivers is 24
feet. Some of the waggons hereon have their fore-wheels
placed quite forward, and the hind-wheels nearly under the
middle of the waggons, by which means flones, &c. can
easily be shot out of them when required. Near to this
rail-way at Mertham there is a quary of white soft fre-
flone (much similar to the Tottenhoe flone on the Grand-
Junction summitt branch). The fhares in this concern are 100l.
each. In September, 1801, it was in contemplation to make
a branch of this intended rail-way from near Ryegate to the
Arun river at Wilborough green; and another branch or
rather an extension hereof, from near Godflone to the
Oufe upper navigation at Linfield. About the month of
June aft (1802), this rail-way between Croydon and Mer-
tham was opened, and 12 waggons loaded with flone, weighing
32 tons, were drawn with cafe by one horse for 6 miles
down the defect to Croydon-turnpike, in 1 hour and 41
minutes; from which place the fame horse fet off again with
4 other loaded waggons attached, and perons riding on them,
making in the whole more than 55 tons, which it was said
he drew with apparent cafe!

SWANSEA CANAL. Act 34 Geo. III.—The direction of this
canal is about N.N.E. for about 35 miles, by a crooked courfe in
the North Riding of Yorkshire. Its northern end is very con-
derable elevated, and this river is subject to rapid and al-
most uncontrollable floods: its objects are the carriage of
coals, and the export of farming products. Aldborough and
Richmond are conderable towns near, or on this river,
which commences in the Tore river at Myton; and the
navigation was intended to terminate at Richmond. In 1767,
Mr. John Smeeon was consulted on the propriety of moving
Topcliff mill to a new feite, in the design which the pro-
pietors of this navigation had adopted of building new mills
in several places, and on which it has been faid that 30,000l.
was expended, and but a small part of the above line was ren-
dered effectedly navigable. Mr. John Smith jun. was the
ficient engineer. In 1801, the Topcliff and Pierbridge was
propofed to join at Topcliff.

SOUTHSEA CANAL. Act 34 Geo. III.—The direction of this
canal is about N.N.E. for about 13/4 miles in the counties of
Gloufcer and Brecknock, in South Wales. Its northern
end is conderable elevated; its objects are the export of
coals and iron-flone, iron, &c. the carriage of lime to the
intermediate works and country; and copper-ore, to the
works, &c. Swansea is the 99th British town, with 6,099
inhabitants. This canal commences in Swansea harbour,
in South Bay, at the mouth of the Tafe river, and
terminates at Hen-noyadd lime-works: a part of this line
between Llandoor brook and Morris town, 1/4 mile in
length, (called Morris's canal) through the eflate of the
duke of Beaufort, was conctrufed by that nobleman, who
receives the tolls thereof. From near Swansea to Llanfamlet
is a branch of 3 miles in length; and a rail-way branch of
about 2 miles to a large coal mine, where an audit or tunnel
of 3 miles in length has been made under ground, and out of
which 200 tons of coals are daily brought; on an incl-
ined-plane on this branch, near 1 mile in length, the coal-
waggons defcend without horses, regulated by a convoy or
brake, as we have before defcribed, and the empty wag-
nons are drawn up the plane again by horses. From the
tide-way at Swansea to oppofite Pont-ar-Taw, 82 miles, is
a rife of 1,200 feet; or, fince to Pont Gwynawladd, 8 miles,
is a rife of 320 feet; and thence 2 of a mile to Hen-noyadd
is a rife of 31 feet. An act 44 Geo. III. pafl for amending
two former ones, for building piers, and deepening and
improving the harbour of Swansea, under the direction of
captain Joseph Huddart. About the year 1797 the weftern
pier, extending 228 yards into the fea, was completed;
which had the effect of confining the current of the Tafe
river, and deepening the mouth of the harbour 2 feet: in
1802 this pier was extended 57 yards farther out, and in
November 1804 a jetty thereto was completed. In April
aft (1805) a new pier was begun on the eftern fide of the
harbour,
harbour, which is to be extended out and brought round wellwardly, within 70 yards of the other pier, for effectually securing and securing the mouth of the harbour: dry and wet docks are also intended, and by embanking the river, a mill spacious quay is to be formed. From this port, in 1768, only 5,474 ships were loaded; but in 1792, they were increased to 10,000 ships, and in 1803 to no les than 25,900 of 1,734,764 registered tons. Within 2 miles of Swansea, seven large copper-works have of late years been created, for smelting of roasted ore from the Cornish and Anglesea mines, brought in ships, which return laden with coals for working the mine-engines and roasting the ore: the number of iron-furnaces, potteries, and other large works near this place are also considerable. This canal company was authorized to raise 90,000l., the amount of shares paid each; and it was provided in the act, that this canal should be completed in 4 years; several railway branches may be made thereto. The engineer was Mr. Thomas Sheaflys, and the canal was completed and opened in October 1798. The rates of tollage may be seen in Phillips’s 4to. Hillys, Appen. pages 166 and 167. Boats with less than 15 tons, when the water does, and 10 when it does not flow over the lock-weirs, are not to pay or paying for that tollage. In the year 1804, 53,235 tons of coal and culver were brought down this canal for exportation, and the gross tonnage on this canal amounted to 35,90l. In Swansea harbour, the Swansea and Oystermouth railway connects with this canal.

Swansea and Oystermouth Rail-way. Act 44 Geo. III.—The general direction of this railway is nearly S.W. by a bending course, following closely the sea thore, for about 73 miles in length in the county of Glamorgan, in South Wales: its object is the carrying of lime-flour, lime, and coals. Swansea is the 99th British town, with 6,696 inhabitants. This railway connects with the Swansea canal in Swansea harbour, and proceeds thence to the Mumbles lime-flour quarries near Oystermouth. In April last (1805) this railway was nearly completed. There is a light-house on the Mumbles point for the security of ships entering Swansea harbour, which was lately improved.

Tamar Manure Navigation. Act 36 Geo. III.—The general direction of this canal is nearly N.W. for about 22 miles, following the course of the Tamar river, on the southern coast of the counties of Devon and Cornwall. Its northern end is considerately elevated: its objects are the import of coals, and sea-fand and lime as manures; and the export of agricultural products. Launceston is the only considerable town on this line; which commences in the tide-way in the Tamar river at Morwellham quay (the commencement of the Tavistock canal) near Callstock, and terminates at Tamarton bridge in North Tamarton, with a branch to Rich-mill grove in Launceston. The Tamar is to be made navigable as far as Port-pool near Blanch-Down, before the canal commences. The locks are to be either about 5 feet or 9½ feet wide, and 124, 244, or 364 feet long, in order to receive a number of small boats, in length and wide by fde therein, as may be judged best. Inclined planes and railway may be substituted in place of locks on the canal in any part. This company is authorized to raise 121,000l., the amount of each share 50l. A feeder may be taken from the Tamar river, and all springs within 2000 yards of the head level, and within 1000 yards of every other part of the line; 200l. per annum is to be paid by this company to the duchy of Cornwall, for the liberty of making this navigation. We have not been able to learn what progress has yet been made in the cutting of this canal. By the act 14 Geo. III., a canal was intended, but never executed, through this line, and extending to the Irish Channel, called the Bude and Launceston canal.

Tamar River. The general direction of this river is nearly north by a crooked course of about 6 miles, between the counties of Devon and Cornwall; the tide flows through the entire length; Beer-Alston is a considerable town near this navigation; which is the point of the import of coal, flax, aud the export of flax and agricultural products. It commences in Hampshire and terminates in the Tamar Manure navigation and Tavistock canal, at Morwellham quay near Callstock. In the year 1754, an act passed for the Bude and Launceston canal intended to connect with this at Callstock, but it was never carried into execution.

Tarkab Canal. In 1753, Mr. Watt surveyed the isthmus between East and West Tarkab holes, on the west coast of Scotland, for a canal to communicate between Loch Fine and the sound of Jura; the distance of high-water mark in the two lochs he found to be 1 mile, and the height of the ridge between them, 45 feet above high-water at neap tides. Mr. Watt’s different estimates were, for a canal with locks 7 feet deep, 175,888l.; and for one to 10 feet deep and a proportional width, 23,884l. The expenses of a thorough cut without locks, of 12 feet deep at high-water, 73,849l., and for one of 15 feet deep, 120,780l. A very large canal has since been formed about 13 miles north of this, called the Cromer canal, which more effectually answers the purpose of communication between Loch Fine and the sound of Jura.

Tavistock Canal. Act 43 Geo. III.—The general direction of this canal is N.E. for about 44½ miles in the county of Devon; a great part of it is considerately elevated above the level of the sea: its objects are the export of flax, copper-ore, and other minerals, and of agricultural products; the import of coals, lime, and other articles for the supply of Tavistock town and the surrounding country; and to facilitate the working of the mines in Morwellham down: this canal commences in the tide-way in Tamar river (near the commencement of the Tamar Manure navigation) at Morwellham quay new basin, near Callstock, and terminates at the town of Tavistock. From Crebar near the north end of the tunnel, it has a branch of 2 miles to the flate quarries at Mill-hill bridge. From the Tamar river, 4 of a mile is level with high-water at Morwellham quay; thence in ¾ of a mile, is a rife of 237 feet; thence, about 3½ miles to Tavistock is level; the branch is level to New Quarry, about 1½ miles; thence to Mill-hill bridge, ¾ of a mile, is a rife of 10½ feet. The locks upon this canal are to be calculated in length and width for the use of boats of 124 feet long, and 5 feet wide, either finely or several together, as on the Tamar Manure navigation above mentioned: but the company have the power to erect inclined planes for boats, or boxes of goods, instead of locks, if they think fit. Through Morwellham down, which is of hard rock, and supposed to be intersected by several fissures, or loads filled with metallic ores, is to be a tunnel about 2500 yards long, and about 460 feet beneath the highest point of the down in its course: near Crebar is to be an embankment and aqueduct bridge 60 feet high, across the Lumbourn river; which is to have a new course cut for it for a considerable distance near the branch of this canal below New Quarry. This canal is to be fed from the Tavy river at Tavistock, and by any springs or fountains within 5000 yards of the line. Mr. John Taylor is the engineer to this canal and tunnel, which paffis entirely through the etate of the duke of Bedford, who has leade to this company the mines which may be found in the tunnelling, or within certain distances of this canal. In February last (1805)
(1803) about 300 yards in length of the tunnel had been cut, and a known load of copper-ore had been intercalated therein, which gave the bell hopes of discovering other unknown ores, as the work proceeds. This company is authorized to raise 50,000l., and the amount of each share is 50l. The rates of tollage are for lime-flour conveyed through the tunnel, 1s. 3d. per ton; for building-stone, flates, bricks, tiles, clay, sand, earth, dung, ores, iron, and metals (made marketable) conveyed through the tunnel, 2s. per ton; and for coal, coke, culm, lime, timber, bark, corn, grain, and all other goods passing through the tunnel, 1s. per ton; and coals, coke, &c., 1s. 6d. per ton. The last rates are not to be charged on any goods either carried or subsequently removed on any part of this canal, which have before paid the tunnel rates; and ores may be carried to the draffing-floors, or the wattle or rubbish of mines or loads be removed to proper places on any part of this canal or its branches, free of tolls. Besides the above rates, all goods which pass into, or from the Tammar river, and are not loaded at Morwellham quay, are to pay as follows for reimbursing the owner and occupiers thereof, for the loss of wharfage on such goods, viz. slate 3d. per ton, lime-flour 6d. per ton; ores, (made marketable) iron, bricks, tiles, clay, sand, earth, and dung, 6d.; and all other goods 1s. per ton; and over and above this, one penny per ton is to be paid on all goods entering the canal basin at Morwellham. The duke of Bedford may make collateral branches or rail-ways to this canal in any part.

**Tay River.** The general direction of this river is N. E. for about 24½ miles in the county of Devon; the tide from the south coast flows through its whole length: its objects are the import of coals, sea-fand, &c. and the export of flate, copra-ore, &c. It commences in Hamaaze and terminates at Lophill quay.

**Taw River.** The direction of this river, or eurya, is nearly east for about 8 miles on the north-west coast of Devonshire: the tide flows through its whole length: its objects are the supply of Barnapple and the adjacent country with coals and other articles, and the export of farming products. This navigation commences in St. George's Channel, at Biddiford bay, and terminates at the town of Barnapple: near to Appledore the Torridge river joins this navigation.

**Taw River.** The general direction of this river, eur, or eurya, is nearly east for about 26 miles, between Angus and Fife, and in the county of Perth in Scotland. The tide flows through its whole length: its objects are the supply and trade of Dundee and Perth, and the adjacent country. Dundee is the 18th British town, with 26,038 persons, and Perth the 26th, with 14,878 persons. This river commences in the German Ocean, and terminates at Perth Bridge. This bridge, built of stone by Mr. John Mylne, was swept away by a rapid flood in 1621. In 1763, Mr. John Sinnot was consulted on the building of a new bridge; and in 1766 he began one of 7 arches, where the river was 892 feet wide: the depth of the Tay at this bridge is 20 feet; and in dry seasons was only 2 feet, at spring tides 10 feet deep. At Staley, 7 or 8 miles higher up this river, three loughs or tunnels of considerable length (one of them from 12 to 9 feet wide arched with stone) are driven through the hill, which occasions a great loop in the river, by which 24 to 20 feet fall is gained, for a large portion of the stream, to work cotton-mills and other machinery; and running in this subterraneous channel it never freezes.

**The River.** The general direction of this river is nearly S. E. by a crooked course of about 12 miles, between the counties of York and Durham: the first four miles are by a very wide eurya: the tide flows through its whole length: its objects are the trade of Stockton, and the export of agricultural products. Stockton is a considerable town on this river: which commences in the German ocean, at Season Nook, and extends to the town of Stockton. In the present autumn there was an intention of improving this navigation. In 1780, the foundations were laid for an iron-bridge, to be erected under the direction of Mr. Thomas Wilson, over this river at Yarm, a few miles above Stockton, in place of an old stone bridge, which had long obstructed the current, and occasioned the river frequently to overflow its banks. In 1768, the Winstanley and Stockton canal was proposed for extending this navigation westward to the coal district about Winstanley.

**Teign River.** The direction of this river, or eurya, is west for about 4½ miles in the south-eastern coast of Devonshire: the tide flows through its whole length: its objects are the import of Newcastle or Welsh coals, and the export of potters' clay, boxey coal, and agricultural products: it commences in the English Channel, and terminates at Newton-Abbots, at the commencement of the Severn canal, near to Newton-Bullock.

**Ternbridge and Winford.** In 1763, Mr. Whittington proposed a canal from the Severn river at Ternbridge below Shrewsbury, to the Wexor navigation at Winsford, 63½ miles, in the counties of Salop, Stafford, and Chelten, with a branch therefrom, near Bridgewater; 43 miles, to the Trent river at Wilkes-Ferry. At St. Severn to the summit or grand-ridge (requiring 25 feet deep cutting,) below Ofley-Park, 24 miles, is a rise of 176 feet; thence to the Trent branch, (½ mile below Bridgewater,) 7½ miles, is a fall of 54 feet; thence to the summit or grand-ridge again, (requiring 25 feet deep cutting,) in Madeley park, 104 miles, is a rise of 800½ feet; thence to the Wexor navigation, 22½ miles, is a fall of 28½ feet; the branch from Bridgewater to the Trent has a fall of 209½ feet. The course of this canal is by Wansford, Alfort, Crudgington, Chetwin-park, Batchere-Grange, Ecclehall, Standon, Wyburnhur, and Batton, near Nantwich. The branch is conducted by Stafford, Tixall, and thence following within a small distance the course of the Trent river. This canal was proposed to be 27 feet wide at top, 15 at bottom, and 5 feet deep, with a towing path on both sides; the locks 60 feet long and 13 wide, and about 10 feet deep each; the boats of 50 tons burthen: 78 road bridges, and 25 accommodation bridges were thought necessary, and 184 aqueducts and culverts: the estimated expense was 99,500l. The Stafford-shire and Worcestershire and the Trent and Mersey canals, which were adopted in the following year, embrace all the general objects of this canal. The Sandbach, and the Newport and Stone, have since been proposed to occupy parts of the southern end of this line, but, like this, were overruled.

**Thames River, (lower part).** Acts 19, 29, 39, 42, 43, 44, and 45 of Geo. III.—This fine river, by far the most important for trade, not only in Britain but in the whole world, has its career nearly west for about 72 miles between the counties of Kent and Essex, and Surrey and Middlesex. The first 20 miles is by an exceedingly wide eurya: the next 21 miles is full an eurya of considerable width; the remaining 31 miles is crooked, and gradually diminishing: the tide flows very powerfully through its whole length. To enumerate its objects would be to recount almost every species of trade and commerce which is carried on in Europe.
Europe. At Earl Mersey it connects with the Colne river; at Weil Mersey, with Blackwater river; at Foulness east point, with Creoch river; at Whitstable and at Sheerness, with the Medway river; at Gravelend, with the Thames and Medway canal; opposite to Purfleet, with the Darent river, or Dartford creek; at Bow-Creek, with the Lea river; at Blackwall and at Limehouse-hole, with the Isle of Dogs canal, (a new side-cut for shortening the navigation of this river;) at Greenwich-dock, and at Wilkinson's gun wharf, Rochesterhite, with the Grand Surrey canal; and, at Limehouse, with the Limehouse canal. London, the first British town, has a population of 864,945 persons; Greenwich is the 4th; with 14,379 persons; and Woolwich is the 23d, with 9,826 persons. Margate, Feversham, Milton, Queensborough, Sheerness, Leigh, Gravesend, Graves-Thurrock, and Deptford, are also considerable towns on or near this lower part of the Thames river; which commences in the English channel at Earl Nefs near Margate, and terminates in the Thames, middle port, at London-bridge. Large ships of war can come up to Deptford, and merchants' ships of 7 to 800 tons burthen frequently lie at the keys close to London-bridge. The port of London, or part wherein the ships lie, generally called the pool, extends almost 4 miles, nearly to Deptford, in which space more than 1000 vessels have been seen moored at one time! the rapidly increasing trade of this great emporium of commerce, the regulations which have of late been made, for mooring the ships at more convenient distances, for a passage up and down the river, and the contiguity of the East India and East India docks to Blackwall are expected ere long, to extend the tiers of ships as far as that place. It was stated, in the year 1800, that the trade of the port of London had increased in the last, or 18th century, by 6,547 vessels and 1,327,763 tons annually; and that (including repeated voyages,) 13,143 ships and vessels were then employed in this trade, to foreign countries, the colonies, and coal-ships, besides 2288 lighters, barges, and punts, employed in the middle part of the Thames, and on the Lea river, and 3336 of the like kinds of vessels used below bridge, in the lading and discharging of vessels, together with 83 boats, ferries, cutters, and hoy, 3000 watermen's whaleries, 155 baw-bows, and 154 pilot-boats, the total number, (exclusive of ships of war, transports, and navy and victualling and ordnance boats,) being 22,500 vessels of various sizes and dimensions, either trading to, or stationed within the pool or port of London; the total value of the goods imported and exported annually by them exceeding 67,000,000l. The corporation of the city of London, as conservators of the river Thames, and under the special authority of the above acts, are, at this time, carrying on considerable works for the improvement of this river; several mooring chains in the pool have been purchased of Lord Gjydir and others, and a harbour-master, approved by the Trinity-house, is appointed to regulate the mooring and conduct of vessels, agreeable to the 19, 29, and 39 of Geo. III. : one of the largest canals ever attempted has been cut, near 14 miles in length, 112 feet wide at top, and 34 feet deep, across the Isle of Dogs, for shortening the passage of vessels to and from the pool, and to avoid the long circuit by Greenwich and Deptford; Mr. William Jeffery is the engineer, under whom the locks and other works of this canal were successfully conducted and nearly finished, when an unforeseen accident, by the blowing up of the coffer and preventer dams, just as the entrance locks were completed, on the 24th of July last. (1805) prevented this canal from being opened until the 9th of December, when the Dukes of York, Well Indianam, of 500 tons burthen, passed through the same, in presence of the lord mayor and corporation of London. Several large sums of public money have been granted by the above acts out of the consolidated fund; for the repayment of which vessels passing through this canal of 200 tons or upwards are to pay 2d. per ton; those from 100 to 200 tons, 2d. per ton; from 100 to 50 tons, 1d. per ton; 50 to 20 tons, 8d. each, and boats and craft 6d. each. Two or more piers are intended to be built at the entrance, for facilitating the entrance of vessels to this canal. Between this canal and the entrance of the East India docks, there is a large mass of silicious pudding-stone, consisting of clay, shelly particles imbedded in a very hard cement, which lies in the bed of the river, and has proved fatal to several ships, on which account the committee, in September 1792, and on several other occasions, advertised for persons who would undertake to lower this rock 18 feet, its length being about 40, and breadth 30 feet; the newspaper accounts of the Boddington Well Indians having struck on this rock on the 14th of September last appear to be incorrect; the rock being now surounded by pikes and buoms, so that no ship can approach it. In the year 1773, Mr. James Sharp suggested the propriety of floating, or wet-docks, for the loading and unloading of ships in the Isle of Dogs; after much discussion a plan was adopted for this purpose, in the year 1799, called the West India Docks, and Mr. William Jeffery and Mr. Ralph Walter were employed as engineers. On the 12th of July 1800, the first stone of this great undertaking was laid with much ceremony. On the 22d July 1802, an unfortunate accident occurred by the bursting of the coffer-dam at the entrance at Blackwall, but which did not prevent the great or import dock, from being opened for the use of West-India ships on the 31st of September 1802. This fine dock, the largest in Britain, is 2600 feet long, 510 feet wide, covering more than 50 acres of ground; its depth being 29 feet, and it is walled in the most substantial manner, with bricks, and coped with immense blocks of stone. Three flacks of the superb warehouses on the banks of this dock were completed at this time; on the 22d of August 1803, several other warehouses on the N. side of the dock were finished, and declared ready for public use; and, on 5th July last, two warehouses on the south side, and the whole of that quay were completed. The outward-bound dock, 2600 feet long, 400 feet wide, and 29 feet deep, has been rapidly proceeding since the completion of the great dock, and is now almost ready, we believe, for opening. At Blackwall, and at Limehouse-hole, there are spacious entrance basons, connecting by tide-locks with the Thames river; from these entrance basons there are locks into the outward and inward, or export and import docks; these docks are calculated for the accommodation of 300 ships, 12 of which can conveniently enter or go out in one tide: there are to be fix immense ranges of warehouses in the whole, with cellars, cranes, and every possible convenience; the whole is to be surrounded with a wall 30 feet high, and a wet foils 12 feet broad, and 6 deep: for security from fire, no dwelling-houses or work-shops are to be built within or near to the boundary wall; no gunpowder is to be suffered to enter the walls, or any fire, candles, or lamps to be lighted within the same, except the necessary fire-lamps on the quays. The company were at first authorized to raise 600,000l. the amount of shares being 500l. each, which, in 1803, bore a premium of 28l. per cent.: the profit to the subscribers are limited to 10 per cent.: several loans of the public money from the consolidated fund have been made towards completing this design. Mooring-chains are provided in the river opposite the entrance basons, for the use of ships entering these docks, in which all West India goods whatever (except tobacco in some cases,) are to be
the land, and all outward-bound ships for the West-Indies are to load herein, or in the Thames at Blackwall; but the tonnage for the building and maintenance of these docks is, (by 39 Geo. III.) not levied exclusively on the West-India trade, as every vessel both on its inward and outward voyage (except coaling vessels under 45 tons, king's ships, corn, fishing, and passenger vessels, and craft navigating above Gravesend,) is to pay: coaling vessels at the rate of 1d. per register ton; and ships trading to or from ports beyond the seas, and paying higher rates, amounting, in some cases, to 1½d. per ton; i.e. the particulars, as also the rates for wharfage, warehouse-room, cooperage, &c. in the Agricultural Magazine, vol. i. p. 115. Mr. Robert Edington, in his Essay on the Coal Trade, 1803, after estimating 4284 coal-ships to enter the port of London annually from the neighbourhood of Newcastle-upon-Tyne, with 1071 chaldrons each, on the average, (a quantity considerably short of the actual importation, see Monthly Magazine, vol. xvii. p. 99, and vol. xix. p. 99.) objects strongly to the above rate, which annually taxes the coals consumed in London and its vicinity with 4284l. on account of these docks, which they are not allowed to enter. For the general accommodation of ships unloading and loading in the port of London, another dock was, after much dilatoriness, undertaken, in the year following, called the London Docks, (or sometimes the Wapping Docks.) Acts 40, 44, and 45 of Geo. III. Mr. John Rennie and Mr. Alexander were the engineers employed, on the 26th of June 1802, the first stone of these works was laid, by Mr. Edington, the then Engineer; and the work proceeded without any difficulty or impediment, until the great dock, the entrance bason, and several of the warehouses were completed, and opened for use on the 11th of February last (1805). The great dock is about 1260 feet long, and 830 feet wide, and covers about 24 acres of surface: it is 29 feet deep from the top of the walls: but the depth of water is only 23 feet; the walls are of brick, coped with stone, and every part of the work is executed in the most complete and masterly style. On the northern side of the dock there is an open fhed the whole length, for examining and weighing the landing of goods, under cover from the weather, from whence a number of small trucks moving on rail-ways convey them to five immense flacks of warehouses behind them, or the cranes hoist them into carts, as may be wanted. Near the S. E. corner of this dock are two immense warehouses let to government for the storage of tobacco; one of them is 762 feet long, and 160 wide, the other 250 feet long, and 200 feet wide, each being in one single room, without any partitions, and their roofs are laid to exceed 6 acres of flatting: they are but one story high, but have spacious arches vaulted under them of the same extent, for the storage of wine, oil, spirits, &c. Other large ranges of warehouses are to be built, and their fronts have been begun north of the present range of warehouses; the windows and doors of these last being bricked up, serve as a temporary wall to enclose the premises: warehouses are also intended on the west and fourth side, where the temporary fence-wall at present stands. The only entrance at present to this dock, from the Thames, is near to Bell-dock in Wapping, where two maffive piers of stone project into the river, and have a tide-lock between them, and further north is a curious iron double swing-bridge, in the line of Wapping-foott, which we have already described; within this is the entrance bason, of an irregular figure, of about 3 acres extent: this bason is connected with the river at every high-water, by the opening of the gates, which shut again and retain the water at that height: from this bason ships lock up into the great dock, whose surface is kept about 3 feet above the height of ordinary tides, by a powerful frame engine erected on the east side of the entrance bason for that purpose, and the bottom of the dock is about 15 inches above low-water mark in the river. There is designed to be another entrance from the Thames by means of Hermitage-dock, into the great dock at its S. W. corner; and from near the opposite or N. E. corner, provision has been made, and the connection made intended, which is to join it with another large dock, intended to be dug, and connect with the Thames at Shadwell. Notices were given in September last of an application to parliament for further powers, to proceed with the above works. The present dock is capable of accommodating 300 merchant ships, and the entrance bason will hold a vast number of small craft, without impeding the passage of ships to or from the great dock. The whole of the docks or warehouses are, when completed, to be surrounded by a very high wall to prevent depredations or the communication of fire, against the happening of which the same regulations are adopted as at the West-India dock above mentioned. Six large mooring chains are fixed at proper distances from each other in the great dock for ships to moor to, consisting of very large floating blocks of deal timber. This company were authorized by their first act to raise 1,500,000l., the amount of each share being 500l. They were required to purchase the concern of the Shadwell water-works for 50,000l.; and ample provisions are made for compounding the owners of the river-quays, the proprietors of street-cart licences, &c. and full provision is made for the receipts and expenditure of this company, and of the West-India dock company, are to be presented annually to parliament. The tolls or rates payable to this company, by ships which enter their docks, are for British coaling vessels (including colliers) 1s. per ton; five other classes of ships are enumerated, which are to pay from 15d. to 50d. per ton; see Agricultural Magazine, vol. iii. p. 102. For the landing, loading, and housing, and for shipping of goods of every different kind, the same sums respectively are to be taken by this company, as were usually paid at the different quays of the port of London in the year 1798. The whole of the site of these docks was covered either with streets and houses, or with gardens, and which the company had to purchase for immense sums of money. For the particular accommodation of the large ships belonging to the East-India company, a third spacious set of docks has been designed, and in the 43 of Geo. III. an act passed for enabling the company to raise 200,000l. for the purpose of building the East-India Docks, and to purchase the dock belonging to Mr. Perry's mafl-house at Blackwall, for their entrance bason. Mr. Ralph Walker is the engineer; and on the 4th of March last (1805) the first stone of this great undertaking was laid by captain Joseph Huddart, and the works are now proceeding with the utmost expedition: the largest, or import dock, is to cover 18 acres of ground, the export dock is to be 9 acres in content, and the entrance bason about 3 acres: the depth of these docks is to be greater than either the London or the West-India docks; the entrance docks now building are 48 feet wide in the clear, and each gate is to be 27-feet wide. Near to Deptford, Greenwich-Dock has its entrance, by a tide-lock, into the river Thames; this dock is about 900 feet long and 400 feet wide, and was constructed several years ago, for the accommodation of ships employed in the Greenland, or whale fishery, with suitable conveniences at proper distances for melting and refining their oil. It is intended that the Great Survey cannal shall have a cut into, and a paffage for its barges, through this dock: and the same company are now excavating a dock near the termination of their canal, at Wilkinron's gun-wharf, Rotherhithe, which
which seems to be intended to admit small ships from the Thames. At Deptford, Woolwich, and at Sheerness there are spacious dock-yards and naval arsenals on the banks of this river, and others at Chatham, within a few miles of it, on the Medway river. In the year 1825 it was proposed to make a large dock and yard, for repairing second and third rate ships of war, of which Major General Binton laid the foundation, near the east pans on the Isle of Grain, on the Medway side of it; its principal object is for repairing the ships dislodge in the Downs and North Seas. In the year 1826 it was proposed to form a wet dock of about 12 acres extent, connecting with the Thames river, by a Northfleet creek near Gravesend: the site of the old chalk pits is intended to be excavated for this dock, in which the new ships of war built at Deptford, Woolwich, and Chatham are to be received and rigged for sea, instead of sending them to Sheerness; that the site there may be wholly appropriated to the victualing and ordnance department. A pier is now building for the protection of Sheerness harbour, under the authorities of the acts of 41 and 42 Geo. III. At Margate, there was an ancient wooden pier in this river, for the protection of the hogs and vessels trading to that place, but in 27 Geo. III. an act passed for an excellent stone pier, which has since been there erected. The great distance which the inhabitants of Gravesend, and Graves-Thurrock, and all those parts, have to travel (over London bridge) to communicate with each other by land, gave rise, in May 1798, to the proposition by Mr. Ralph Dodd for a tunnel, or road arch, under the Thames, from near Gravesend to Tilbury Fort (see Nicholson's Journal, 40. vol. ii. p. 473); and an act of 40 Geo. III. passed to authorise the raising of 55,000l., in 100l. shares, for the Thames Tunnel, and to levy 28. 6d. on each coach, 4s. on each waggon, 25. on each cart, 15. on each horse, 26. on each foot-paletter, and some other tolls, for passing through this tunnel. Government to pay 100l. annually, in lieu of all tolls, for the passage of troops and of government electors of every kind: Sol. to be paid annually to his majesty, and 30l. to the corporation of Gravesend and Milton, in lieu of the right of ferries, near the intended tunnel, to which they are entitled. Mr. Dodd proposed his arch to be a cylinder of 16 feet diameter in the clear, and estimated that the building might be executed for 10,000l., the length of the tunnel being 600 yards; but it does not appear that at this time, or for more than two years after, any borings had been made, even on the shore of the river where the tunnel was intended, to prove whether the chalk rock, which Mr. D. had calculated upon tunnelling in, existed or not: at length, about September 1802, a bed of chalk, supposed to be the same which appears on the surface at Gravesend, was discovered, by Mr. D.'s borings, at 72 feet beneath the surface, at Tilbury Fort; a steam-engine was thereupon erected, and a perpendicular shaft of 150 feet deep was sunk at Gravesend, all in chalk; when, by one of those unaccountable accidents to which abortive schemes frequently hale, this engine-house took fire, and was burnt down, and shortly after the scheme was given up altogether. In the last session of parliament (45 Geo. III.) an act passed for making other archways under the Thames, for the passage of carriages and foot paletters, between Rotherhithe and Limehouse; and we have since read that Mr. Robert Virtue is the engineer to these Rotherhithe archways, that the foot-way arch is to be made a little to the west of the London Dock entrance, and the carriage-way arch at the present horse-ferry between Limehouse and Rotherhithe. On inquiry, we have been told, that the present scheme is, to sink a shaft on one shore of the Thames, with an engine thereon and pumps, and to continue the same to a sufficient depth, at which to be in the tunnel opposite the shores, round to the opposite face of the river one way, and to part from it in an opposite line, by a regular and proper chain of bridges. We can hardly suppose that this matter has proceeded thus far, without its being attended, by the least inquiry into what is proper on the other side, that there may be an approach to the clay, beneath the alluvial matters, which may be filled up with quaker or other loose fill unanswerable to tunnel through, under the bed of a river: but, if we admit the whole matter to be bold clay under the water way or bed of the river, yet the number of houses which must be pulled down, or enlarged, opposite to the tunnel, in the way of conducting the bridges, in order to bring the archway to the surface on one side of the river, and the inconvenience which that entrance will be from the water-side, are almost insuperable objections to its adoption. We have no doubt of the practicability of forming as many arch-ways under the Thames as may be wanted (if money is not spared, and scientific and proper men are employed on the work), but are of opinion that for such to succeed, the river must be piled off, for shunt lengths at a time, while the necessary excavation is made in the bottom for turning a length of the arch's, and securely covering it with clay or puddle: and after several successive lengths are thus formed, the water and traffic of the river may be admitted over the part which is completed. Very powerful pumping-engines will be necessary, in this or any other way of conducting such a work with the probability of success. The Thames river, below London, is embanked through a great part of its course; the time when these banks were first erected is uncertain, but they appear to be of great antiquity; and during several hours of each tide, the adjoining meadows are 10 feet or more below the level of the water. At Dagenham, about 7 miles below Blackwall, a large breach in one of these banks happened, which captain John Perry succeeded in stopping, after several others had failed in their attempts. On the 5th of August 1776 the plan was first adopted of employing convicts in ballasting, and other works for the improvement of the river Thames, under Mr. Duncan Campbell; these men, properly ironed, are lodged in bukis, or old vessels, off Woolwich, and have principally been employed in enlarging the wharfs at Woolwich Warren, or Royal Arsenal, which work is still proceeding. In the year 1787, and again in 1802, the London Lynn and Norwich (or North London) canal was proposed to join the Thames river at Limehouse. In 1798 a new channel was proposed to be cut for the Thames river straight across the Ile of Dogs, and dams with sluices and locks to be made on the old course of the river, for converting the same, round the island by Deptford and Greenwich, into one vast floating dock for ships! About the same time, the London Docks were in contemplation, and a canal was proposed to extend from them to the Thames river at Blackwall; the Ile of Dogs canal has since been made, and in part answered those purposes. In 1802 the Canterbury and St. Nicholas-Bay canal was proposed to join the Thames at the latter place; and in the same year the London and Waltham-Abbey canal was intended to join at Bell-wharf in Shadwell. The Thames and Medway proprietors pay 15. annually as an acknowledgment to the city of London, as conservators of the Thames river, for the liberty of connecting therewith. 

**Thames River (middle parts).** Acts 14 and 17 Geo. III. The general direction of this part of the Thames river is northeasterly, by a very crooked course of 37 miles between the counties of Surrey and Middlesex; the tide flows through the first 16 1/2 miles thereof to Richmond bridge: its objects are the supply of London, and the immense trade which is carried on.
on with the rivers and canals westward: at Vauxhall creek it is joined by the Grand Surrey canal; at Wandsworth entrance-basin, the Surrey Iron Railway joins; at Brentford Creek the Grand Junction canal joins, and at Ham Hall, near Shepperton, the Wey river joins (2 miles from the junction with the Basingstoke canal). London, the first British town, has 864,355 parsons; Wandsworth, Brentford, Kingston, Chertsey, and Staines are also considerable towns on this part of the Thames navigation; which commences in the Thames lower part at London bridge, and terminates in the Thames and Isis navigation at London-fone, at the extremity of Middlesex county, about 6 miles above Staines bridge; from near Chelsea, Pinmill creek extends for about 6 miles to Chelse waer-work engines. From low-water at Richmond bridge to London-fone, 204 miles, is a rake of 36 feet; see a fiction thereof in Gentleman's Mag. March, 1771, and in Zachary Althwe's Considerations on the Thames River, 1805, wherein it appears, that the navigation heron is in two or three places interrupted by shallows, not exceeding 2 feet 9 inches depth of water in ordinary times. At Laleham, Mr. John Rennie gauged the current of this river, in the dry season of 1794, and found 1155 cubic feet of water per second to be then passing down. The corporation of the city of London, as conservators of the river Thames, and by the 17 of Geo. III. above, were authorized to make any new fide-cut by this part of the river, or to erect any weir quite across the channel of the river; and their exertions for the improvement of this navigation, so much in need of amendment, have been confined to the erecting of jetties and weir-hedges, for contracting the breadth of the stream in many of the shallow places, to the dredging or ballasting of others, to deepen the channel, and to theestablishing of regular fuffices of water, twice a week, or oftener, from the ponds and mill-dams in the upper part of the river, for enabling barges, during the run of such fuffices, to pass the shallow places; except, that they have completed a good horse towing-path through the whole length of this navigation, beginning at Putney bridge, on the south shore of the river: immense sums of money (upwards of 1,400l. per annum) having been expended on the above inefficient measures, and yet the navigation in all dry seasons continues intolerably bad, and also frequently interrupted and rendered dangerous by floods. We are happy to observe, that notices were given in September last (1803) for an act to authorize the making of weirs across the river, and fide-cuts and locks, in the parishes of Laleham, Littleton, Shepperton, Sunbury, Chertsey, and Thorpe. The above act (17 Geo. III.) authorized the city of London to purchase certain local tolls on the navigation between Staines and Richmond, and to levy 4d. per ton per voyage up and down, for the above purposes; they have a commodious barge stationed on the river for the residence of a collector of this toll, and an annual account of all the receipts and disbursements under this act is presented to parliament. The Grand Surrey canal was (by its act 41 Geo. III.) required to pay 2 guineas a year, and a rent of 60l. annually, for the liberty of connecting with this navigation; and the Croydon canal 40l. per annum; the Surrey Iron Railway is to pay 10l. per annum; and the Grand Junction company are to pay 600l. per annum, and a toll of 4d. per ton on all goods which pass into or out of this canal. Among the bridges upon this navigation, London Bridge, at its commencement, built of stone in 1209, comes first to be noticed: the river at this place is about 500 feet wide, the bridge, which is 60 feet high and 74 feet wide, consists of 19 arches, the middle one of which is 72 feet wide, but the next there- to on each side are narrow ones, and no regular order is to be observed in the arrangement of the arches, which are most of them of different widths, under 20 feet; the piers between them are immensely thick, being also surrounded with flarlings or vast frames of piling and cros beams of timber, intended for the protection of the foundations of the bridge: previous to the making of the large lock or centre arch, in 1755 (by the removing of a pier and its flarling, and turning one large arch instead of two) the clear water-way between all the flarlings amounted but to 194 feet, and above the flarlings (which are covered when the tide has risen about two thirds of its usual height) the water-way amounted to only 430 feet, or half the width of the river; a further obstruction also arises from the water-wheels, which are fixed on the upper side of the bridge at both of its ends, opposite to several of the arches, for pumping up water for the supply of the city of London and Borough of Southwark. By these contractions of the water-way, a fall and current is occasioned under this bridge, which, for several hours of each tide is quite tremendous, and proves a most serious obstacle to navigation, as well of danger to the bridge itself. If Mr. John Smeaton's advice had not been quickly followed, in 1756, in returning and throwing in the fones, which had been recently taken up from the old middle pier, together with many cargoes of other large and rough fones, the adjoining flarlings and piers of the great lock would certainly have been undermined and the bridge have fallen: large quantities of chalk and Kentifh rag-llones are now annually brought and deposited within the piling of the flarlings, and between them, at the time they are repaired; a work for ever requiring to be done, in some part or other, of these clumsy obstructions to the waters and to navigation: immensely deep gulphs are formed at each side of the bridge by the pitch or fall of the water, and the full and rubbish excavated therefrom is continually thrown up at a distance, so as to form large banks dry at low-water, in spite of a continual dredging or ballast-heaving, which is reformed for to removing them. These inconveniences, which had been long and loudly complained of, occasioned, about the year 1759, a proposal, for pulling down this bridge, and substituting two stone bridges, with capacious arches: these were to be placed near to each other and to connect at their ends; the centre arch of each was to have a draw-bridge, for admitting ships up the river, as far as Blackfriars bridge; the intention of the two bridges being, that one of the drawbridges might always be shut down for the passage of carriages and persons, while ships might be passing through the other into or out of the bayon between the bridges. Another proposal was, to construct a cast-iron bridge of one single arch of 600 feet span and with 65 feet clear opening above high water; as we have already mentioned; these, and other projects for the same purpohe were minutely and carefully examined by a select committee of the House of Commons, and their reports, together with views of the different proposed bridges, have been since published, and a proposal made for a cast-iron bridge of three arches, resting on stone piers, the centre arch 65 feet high for the passage of ships; in September 1802, the city of London gave notice of their intention to apply for an act of parliament for removing London bridge and building another, but nothing further, we believe, has since been done. Blackfriars Bridge is an elegant stone structure, offering fearely the least impediment to the navigation; it was built in 1779, by Mr. Robert Milne; the river in this place is 935 feet wide, it has 9 large elliptical arches, the centre one 100 feet wide, the others regularly diminishing to the outside ones which are 70 feet each. The whole cost of this bridge, in the 102 years during which it was in hand, was 150,840l. Westminster Bridge was built of stone in the year 1750; the river in this place.
place is 1220 feet wide; there are 17 large, and two small semi-circular arches in this bridge, the central one 76 feet wide, the others diminishing by 4 feet each in width, to the small ones at the sides; the cost of this bridge and its avenues was 380,509l., and it was about 10 years in hand. At Battersea and at Putney there are narrow, low, and inconvenient wooden bridges over this river. On the 4th of June 1783, a hand-made and convenient stone bridge was begun over this river at Kew, and in the year 1774, another stone bridge was begun at Richmond. About the year 1801, a new stone bridge was built over this river at Staines, but it was shortly after obliged to be taken down, owing to a settlement therein; an iron bridge was next constructed, and opened on the 3d of September, 1803, of one arch, with 186 feet span, rising only 16 feet above the stone abutments on which it rested; but this, we are forry to add, has lately suffered the fate of the other, and has necessarily been taken down, a circumstance the more to be regretted, as this was the first cast-iron bridge brought into use in this part of the kingdom. At Walton, there is a curious bridge, consisting of a large wooden opening, and smaller brick arches on each side of it. It may be proper to add, that the intention has very recently been announced, of building a new stone bridge over this river from Vauxhall to Millbank, with a new road over the same from Vauxhall turnpike across Tothill fields to Pimlico. In the year 1770, and again in 1794, the Maidenhead and Iffeworth canal was proposed to join this river at Iffeworth and at Bolton's Lock, or Taplow mill; in 1792, the Hampton Gay and Iffeworth was proposed to join at the latter place; in 1801, the Leatherhead and Thames railway was proposed to join this river at Weymouth, and an extension of the Grand Surrey canal was intended to Kingston; in 1802, a cut from the proposed western branch of the Grand Junction canal was proposed to join at Ham Haw opposite to the Wey river; and, in 1803, the Pershore and London railway was proposed to terminate in Stamford Street, near Blackfriars bridge.

THAMES AND ISIS NAVIGATION. Act 11, 15, 28, and 35 of Geo. III.—The general direction of this navigation is nearly N. W. by a very serpentine and crooked course of about 110 miles between the counties of Surrey and Berks, and of Bucks, Oxford, and Gloucester: its western end is considerably elevated; its objects are the supply of London and the carriage of goods, and a variety of other articles; near Reading it connects with the Kennet river; at Abingdon, the Wilts and Berks canal joins this navigation: at Badeck's garden in Oxford, this navigation is joined by the Oxford canal, and at Godalming, by the duke of Marlborough's cut from the same canal. Oxford is the chief town, with a population of 11,904 persons, and Reading is the 55th, with 9,742 persons; Staines, Windsor, Maidenhead, Great-Marlow, Henley, Wallingford, Abingdon, and Lechlade, are also considerable towns on this navigation, which commences in the Thames middle part at London-Stone near Staines, and terminates in the Thames and Severn canal at Lechlade. From Staines-Rome to the water above Bolton's Lock, 15½ miles, is a rife of 34 feet: thence to the entrance of the Kennet river 24½ miles, has a rife of 27½ feet, besides the rife at the weirs; thence to the termination of the Thames and beginning of the Isis river, is about 23 miles; thence to the Wilts and Berks canal about 10 miles; thence to the Oxford canal about 8 miles, and thence to Cricklade about 29 miles. The Gentlemen of the counties adjoining this navigation are Commissioners for executing, in different districts, the above acts; they have borrowed 60,832l. and have expended the

fame, over and above the surplus of the toll, in making 24 side-cuts with opening weirs and pound locks, with a horse turning-path, and other works for improving this navigation, which is now accomplished, so that very long and wide barges, drawing 3 feet 6 inches, can go in general past the fame; the rate of turnover is only 4 per cent per mile; and an account of the receipts and expenditure on this concern is annually presented to parliament. In 1766, the receipts amounted to 95,351l. in 1801, to 125,662l. in 1842, to 171,251l. Mr. Lovemy Althuis, an engineer to the said and 3d district of this navigation. In the year 1798, Mr. Bridgestreet prepared a design and model for his Majesty, of a cast-iron bridge, of one arch, proposed to be erected over the Thames at Butet. In the year 1779, the Reading and Maidenhead canal was proposed to join this navigation at Sunning, and at Bolton's lock; in 1832, a western branch of the Grand Junction canal was proposed to join this navigation at Harneyford near Great Marlow, and crossing the same at that place, it was to proceed to join it again near Reading; and in the same year another branch from the Grand Junction, through Abingdon, was proposed to join this navigation near to Abingdon, and to the Wilts and Berks canal.

THAMES AND AVON CANAL. In the reign of Charles II., Mr. Joseph Mason was employed to survey the line for a canal, and a bill was prepared and brought into parliament, from the Thames and Isis navigation at Lechlade, by Cricklade, Malmsbury, Chippenham, and thence by the course of the Avon river to Bath, 40 miles in length; in 1754, this design was again revived, with the idea of employing the folders upon it; and it was flated that a canal 50 feet wide at top, 50 at bottom, and 4 feet deep, might thus be completed for 10,000l. per mile.

THAMES AND MEDWAY CANAL. Act 40 and 44 of Geo. III.—The general direction of this canal is S. E. for 3½ miles in the county of Kent; it is level with the ordinary high tides in the river Thames; its object is for shortening the voyage of barges from Gravesend to Chatham round by the Nore; Chatham is the 40th British town, with a population of 10,055 persons, and Rochester the 90th, with 6,817 persons; Gravesend is also a considerable town near this canal, which commences in the Thames river at Gravesend, and terminates in the Medway river at Nicholl's shipyard in Frensham, with a cut from Whitewall on the line of this canal to the Medway at Strood, opposite to Chatham royal dock-yard. Tide-locks and entrance basins are to be made at each of the three terminations of this canal; Mr. Ralph Dodd was the projector of this canal, on which Mr. John Reenie and Mr. Ralph Walker have since been employed. In December 1801, this canal was completed from Gravesend to Denton. The company were authorized to raise by the first act 60,000l. in 100l. shares, and a further sum by the last act, and they are to pay 1s. annually to the city of London as conservators of the Thames river, for the liberty of connecting therewith, and to the corporation of Rochester, as conservators of the Medway, for the same privilege.

THAMES AND SEVERN CANAL. Act 23, 31, and 36 of Geo. III.—The general direction of this canal is E. S. W., for 30½ miles in the counties of Gloucester and Wilts: it crosses the Grand Ridge by a tunnel; its objects are a communication between the Severn and Thames rivers, the supply of the country through which it passes with coal, deals, &c. and the export of farming products. Stroud is the 114th British town, with a population of 5,422 persons; Minchinhampton, Cirencester, Cricklade, and Lechlade, are also considerable towns on or near to this canal; which com-
mences in the Stroudwater canal at Wallbridge near Stroud, and terminates in the Thames and Its navigation at Lechlade; it has a branch of about 1 mile in length to the town of Cirencester. Proceeding from Cirencester, or Salperton, 21 miles, it is a rise of 243 feet by 26 locks; hence, the summit pound continues through the Tunnel, 15 miles, to near Cirencester and Lechlade; thence, to the Thames and Its navigation, 205 miles, it is a fall of 154 feet by 14 locks. The first 4 miles of this canal from Stoud to Brinkome, port Bandon, is of the same width and depth as the Stroudwater canal, and is navigated by the Stroud boats; the remainder of the line is 4 feet wide at top, 30 at bottom, and 5 feet deep; at Brinkome-port, goods going seaward are removed into barges 80 feet long and 12 feet wide, which carry 70 tons each. The famous tunnel on this canal at Sapperton, is 1,400 yards long, the arch being 25 feet wide in the clear, and 250 feet beneath the highest point of the hill, which proved to be hard rock, much of which required blasting, and some of it was too solid to need any arch of masonry to support it; the other parts are arched above, and have inverted arches in the bottom; the cost of excavating this tunnel, in 1788, amounted to 8 guineas per cubic yard. The summit level of this canal is supplied by a feeder brought through lord Bathurst's gardens. Mr. Robert Whitchurch and Mr. Joseph Cheere, were the engineers. On the 29th of April, 1789, the Sapperton tunnel was finished, and on the 19th of November of the same year, the whole line was completed and opened. We are sorry to have heard it reported, that this canal has been converted through porous gravelly soils, when a lime for the face, equally convenient, might have made the cuttingfail in a clay soil, and that pudding has been in too many instances neglected or has failed, by which the canal is rendered short of water, and the land and mills have been greatly injured: fanciful round buildings like those, were not made in different places on this canal, for the 'refuse of the lock-keepers. This company were authorized to raise 255,000l., the sums being reck. each; there was a provision that 3 per cent. interest should be paid (out of the principal) to the fabricators on their shares, until the canal was completed and opened; we have heard that the present profits are not much above y 1 per cent. No flamps were necessary to the proceedings of this company. The rates of tollage and the regulations thereof with the Stroudwater company, are very long. See Phillips's 420. History, pages 222 to 225. Manures for the adjoining lands are to pass toll free; less than 6 tons not to pass the locks without paying for that weight; 1/2 mile-flows to be erected.

In 1759, this company offered bounties for introducing the coals brought by their canal to the western parts of Oxford and Berk shires. The Gloucester and Berkeley company are to compensate this company, in case the construction or repair of their works interrupts at any time the communication with the Severn. In September 1809, it was intended to make from near logleham a forked branch passing Fairingdon and Highworth, to connect with the Wilts and Berks canal in two places.

THAME'S CANAL. Act 13 Geo. III.—The direction of this canal is nearly N.E. for about 4 of a mile in length, in the Well Riding of Yorkshire; it is considerably elevated, near to Skipton, which is a considerable town; it commences in the Leeds and Liverpool canal, near Skipton, and terminates at Skipton-castle, lime-flone quarries. It was cut at the private expence of the earl of Thame, through whose estate alone it passes, except one clofe; its object is to convey coals to the lime-kilns, and to export lime as a manure and for building.

THAMES AND DUAL NAVIGATION. The general direction of these rivers is east, or nearly 30 miles in the county of Norfolk; they are not greatly elevated above the sea in the immediate places and the importation of coal, deals, &c. and the export of farming products. Yarmouth is the 57th British town, with a population of 13,157 persons; Aylsham is also a considerable town on this navigation, which commences in the Yare river Yarmouth, and terminates at the town of Aylsham; it has branches from near Thurne and Horning, through the fens and broads, to Hickling and Dilham, about 8 and 10 miles in length.

TRENT RIVER. (Lower part.) Act 34 Geo. III.—The general direction of this navigation is nearly S.S.W. by a bending and crooked course of about 115 miles, skirting Yorkshire for a short distance, and through the counties of Lincoln and Nottingham, and between those of Leicester and Derby: it is not greatly elevated in any part: its navigation,
CANAL.

The importance of the navigation which it forms with other rivers or canals: at Kashley it connects with the Grantham and Keighley canal; at Stockham, with the Idle river, and near the same place with the Gildersfield canal; at Tunkley, with the Fijiolle canal; at Gainsley, in South-Mulcham, with the Dee river; at Trent-bridge, near Holme-piepout, with the Grantham canal, and the Nottingham canal; near Sawley, with the LongFramebuffer navigation, or San river, and the Buresly canal. Nottingham is the 17th British town, with a population of 28,901 persons; and Newark is the 17th, with 6,700 persons. Burton upon Strath, Gainsborough, Newark, Southwell, and Bingham, are also considerable towns near this navigation; which commences in the Humber river at Trent-fall, (at the junction of Ouse river, and Market Weighton canal,) and terminates in the Upper Trent river at Sawley-ferry, at the junction of Dr. Sway canal, and the Trent and Mersey canal. It has a whole of 10 miles in length, made in imitation of the above act, for avoiding 21 locks, and 2 bridges, which occur in 15 miles of the river between Trent bridge, at the commencement of the Nottingham canal, and Sawley Ferry, at the commencement of the Trent and Mersey canal. This act has a rise of 20 feet, and it crosses and connects with the Buresly canal near Sawley; it has also a short cut, and lock into the Trent in Beeton. The farther part of this river is through towns, and is embanked on both sides: it is subject to very great floods: the tide flows to Gainsborough, so that small vessels can come up to that place; but between this and Wilden-ferry, a great number of shallows occur, owing, in a great measure, to the too great width of the river: Mr. John Smith, who examined it in 1761, rates, that in several places in the common flat of the river, in dry seasons, there was not above 8 inches depth of water; that at such times, without the aid of sail and pumps, it was impossible to raise a vessel on this river, and the lowest mills upon the Derwent, navigation was impracticable. The 33 of Geo. III. for Grantham canal required the proprietors of this navigation to deepen the bed of their river, so that there shall always be 30 inches deep of water in the drier season; for boats to pass between the Grantham and the Nottingham canals, and by which they may also pass into the Trent canal, for avoiding the shallows above Nottingham. An act was passed a few years ago for building a new bridge over this river at Gainsborough. In 1803 a new bridge was intended at Gunthorpe-ford. In the year 1759 and 1760, several acres of land were gained from the wide muddy banks of this river, by filling up the ditches by means of furze hedges, to check the current, and ensure the abundance of depots for the current, or the current, and ensure the abundance of depots for the current, or the river. 32 Geo. III. 12, the 33 Geo. III. for Derby canal, only left the said state to be changed, to grade well, or only the tributary river, into the river, with every means that will cost £200. 2 Geo. IV. by Grimsby canals, the company are to leave the navigation for 10 years, and 2 Geo. IV. for all other purposes, excepting the road-works and public works, which cost the river, when deposited at above, between the Grantham and Nottingham canals. In 1760, the Buresly and Kings-Bridge, and in 1792, the Trenthouse, and Bridgewater canals were proposed to join this river at Wilkin Ferry, where the Trent and Mersey canal now joins.

TRENT RIVER, (upper part). Acts 6, 10, 15, 16, 22, 25, 29 Geo. III. This general direction of the navigation is in W.S.W. by a crooked course of about 25 miles, in the forest and Staffordshire, and entering Leicestershire: it is not very greatly elevated above the sea, in any part: its objects are the carriage of coals, and the export of lead, gypseous, earthenware, silk, and agricultural produce: it connects at Swatkstone with the Derby canal, and has the Trent and Mersey canal running the whole length almost by its side, and communicating with it at two extremities. Burton-upon-Trent is the only considerable town on this navigation; which commences in the lower Trent navigation at Wilden Ferry (at the commencement of the Derwent river and Trent and Mersey canal), and terminates near Burton, at a branch from the Trent and Mersey canal. The turn of Ocker bridge is the first proprietors of this navigation, and all other persons are restricted from erecting or using wharfs or warehouses on its banks without his special consent. The canal or his lessees are entitled to 3d. per ton, on goods navigated on any part of this navigation; which was fixed, in 1765, to be unimproved, except by the erection of locks at two different mill-wheels, and more than 20 shallows then existed, over which boats could not pass in dry seasons, without the aid of pumps. Strange stories were at that time related of the conduct of these lessees, and incursions were made, that a barge loaded with stones was sunk by design in Kings-mill lock, and which lay there almost 5 years, and obliged all goods to be unloaded into fresh boats at that place! happily the rivalry of the canal by its side, renders such an occurrence hereafter unlikely ever to happen. The bridge over this river at Burton-upon-Trent is said to be the longest in England, being 1,423 feet long, with 34 arches. It may be proper here to remark, that Mr. Scouett, in 1758, recommended the making of a long bridge or water-road adjoining the lower part of this river, between Mulcham and Newark, that should have 500 yards of clear water-way through its arches! In 1763, the Brecon rail-way was proposed to join this navigation at Welton Cliff; in 1769, the Commercial canal, and in 1797, an extension of the Affleby de la Zouch canal was proposed to connect herewith at Burton.

TRENT AND MERSEY CANAL. Acts 6, 15, 16, 25, 29, 32 Geo. III. This canal (sometimes called the Grand Trunk, or the Staffordshire canal,) has its general direction about E.S.E. by a very bending course of 43 miles in the counties of Chelford, Stafford, and Derby: it crosses the grand-river by a tunnel; its objects are the export of coal, salt, pottery-wares, lime, gypseous, Saltland-flutes, agricultural produce, &c. and forming parts of the grand inland communications between Liverpool and Manchester, with Hull, Bristol, and London; at Quarn's wood in Stoke, it connects with the Newcastle-under-Lune canal: at Great Haywood with the Stafford and Worcestershire canal; at Fradley Heath with the detached part of Coventry canal; and at Swatkone it crosses and connects with the Derby canal. Although none of the towns on this long canal appear to have so many as 5,000 inhabitants, yet Northwich,
Northwich, Middlewich, Sandbach, Newcastle-under-line, Stone, Stafford, Rudsey, Lichfield, and Burton-upon-Trent, on or near to the site, are of considerable places.

The commencement of this canal is in Bridgewater's canal at Prenton-brook, and its termination in the Trent lower navigation, at Wilden-ferry near Shardlow, the point of junction of the Trent canal, or side-cut, the upper Trent navigation, and the Derwent river: from Etruria, a principal branch (sometimes called the Caldon canal) proceeds by Froghall to Uttoxeter, by a very bending course of about 28 miles in length; from this, at Froghall in Kinglsey, there is a rail-way branch of 3½ miles to Caldon-low line works, also from Stanley-Mofs in Endon there is a canal branch of about 3½ miles to the town of Leek, and from Shelton, a short cut to Cobridge: from Stoke-upon-Trent there is a rail-way branch to Lane-end; and from Etruria another to Handley green; from Longport to Dale-hall there is a canal branch, and the fame is continued forwards by a rail-way to the potteries at Burslem; there is a cut 1 mile in length to the Trent river near Burton. Near Lane-delph, and in Harc-ecalla there are short cuts or tunnels, extending to the pits or feams of coals. From Bridgewater's canal to Middle-wich, 18 miles, is a level: thence to near Talkl, 11 miles, is a rife of 326 feet by 35 locks; thence along the summit-pound, and through Harc-calla tunnel to the Caldon branch at Etruria, 6 miles, is level; thence to the Stafford and Worcee-fee canal at Great Haywood, 12 miles, is a fall of about 150 feet and 19 locks; thence to the Coventry canal at Fradley Heath, 13 miles, is about 32 feet, and 4 locks; thence to Horninglow wharf, 12 miles, is about 86 feet fall, and 11 locks; thence to the Derby canal at Swarktone, 10 miles, is about 16 feet fall, and 2 locks, and thence to the Trent river at Wilden-ferry, 6 miles, is a fall of about 32 feet, and 4 locks. From the summit level of the line at Etruria to near Bagnal on the Caldon branch, 5½ miles, is a rife of 75 feet, by 7 locks; thence to Stanley-Mofs, 1 mile, is level; thence to Froghall, 93 miles, is a fall of 61 feet, by 9 locks. From Prenton-brook to Middlewich, at the western end, and from Wilden-Ferry to Horninglow near Burton, at the easterne end, the width of the canal at top is 31 feet, at bottom 18, and it is 5½ feet deep; the locks here are 14 feet wide, adapted to river barges of 40 tons burthen; the middle part of the canal, and its branches, are 29 feet broad at top, 16 feet at bottom, and it is 4½ feet deep, the locks being only 7½ feet wide; the boats are 80 feet long, 6 feet wide, and carry 18 to 20 tons of lading. There are 16 public wharfs on this canal with warehouse, cranes, weighing-engines, and other necessary conveniences at each. Over this canal there are 358 road and foot bridges, and under it 3 large aqueducts, and 124 letter ones and culverts. Through Harc-calla Hill is a tunnel of 2888 yards in length, and upwards of 70 yards below the hill; this tunnel intersects, and has 5 crofs branches to, several veins of coals in the hill, and is also famous for being the first public canal-tunnel constructed in England; the driving of this tunnel, in 1767, cost about 500,874d. per yard run; the height of the arch is 12 feet, and its width 9 feet within side.

At Prenton-on-the-hill near Bridgewater's canal is another tunnel of 1241 yards in length; at Barton in Great Bud-worth is another, 572 yards long; at Saltersford, or Salters-field, in the fame parish, is another of 350 yards long, and there is a fifth tunnel at Armitage, or Hermitage, of 130 yards in length; the heights of the fcate tunnels are 171½, and their width 13½ feet. At Monks-bridge there is an embankment 13 feet high of 1½ mile in length, and an aqueduct bridge over the Dove river of 23 arches, from 15 to 12 feet wide each. At Alrewas is an aqueduct over the Trent river, with 6 arches of 21 feet span; and near Middle-wich is another aqueduct over the Dane, with 3 arches of 20 feet span. In the Rudyerd vale, N.W. of Leek, near the grand-ridge, is a resevoir of 150 acres extent, with an artificial head 30 feet in height; from this a feeder conducts its water to the Leek branch, and thence into the summit ponds of the Caldon branch, and of the main line: there are four smaller resevoirs near the summit, which measure together 60 acres; all waters within 5 miles of the line are allowed for the use of this canal. The rail-way branch to Mr. Gilbert's Caldon lime-works, made about the year 1777 or 1778, was composed of cast-iron bars pinned down upon rails of wood fixed across wooden sleepers, as we have before describ'd; it appears to have been set out, before the true principles of this excellent mode of conveyance were so well understood as at present, being very crooked and with frequent variations in the angle of its acent; in the left of the above acts, there is a provision made for varying the line of, and improving this rail-way. It is laid to have coit, at first, about 1750l. per mile; in 1794, one horse, we are told, for 9 months in the year, made in each week three journeys on the one days, and two journeys on the other two days, hauling 3 tons 6 cwt. of lime-floor down each journey, from the quarries at Caldon to Froghall wharf; for forwarding this floor to the canal at Etruria, the company found boats, the largemen found their own horses and boy, towing lines, &c. and delivered the floor at Leek, at the distance be- ing about 161 miles. Mr. James Brindley, Mr. John Smea-ten, and Mr. Hugh Nicolls were the engineers employed or consulted on the works of this canal, which were begun in July 1766; in April, 1773, the line eastward of Harc-calla tunnel was completed, and in May, 1777, the whole line was completed and opened: the Leek branch, the extension of the Caldon branch to Uttoxeter, and the Cobridge branch have been underucken since the year 1775; the Lane-end, Handley-green, and Burslem branches were projected in 1802. The first act above included 6 miles of the west end of Bridgewater's canal, but with a power to affig or make over the same to the duke of Bridgewater, which was accordingly done; the 6th act above affered 11 miles of the Coventry line, between Fradley-heath and Fazeley, to this company, who completed the fame, and then fold it in equal moieties to the Coventry and the Birmingham and Fazeley companies, as before mentioned. This company have been authorized at different times to mile 334.250l. the amount of their shares was 220l. each, until 42 Geo. III., when a division of them was made into 1001. shares. The rates of tonnage are 1½d. per ton per mile, with reasonable wharflage after 24 hours, on all kinds of goods; but paying and road-materials (lime-flores excepted,) and manures pafs toll-free on the pounds and through the locks, when water runs wants over their paddle-wells. The act 33 Geo. III. for Derby Canal, granted some rates to this company on goods crossing this canal or passing out of it into the Trent by the Derby canal; see Phillips's 4to Hist, Appendix, p. 58 and 59. In the years 1760 and 1765, the Wilden and Kings-Bromley, and the Tern-bridge and Windsor canal were propos'd through parts of the tract now occupied by this canal: in 1793, the Sandbach canal was propos'd to join near that place, and the Bredon rail-way was intended to be connected herewith near Welton-chif: in 1796, the Commercial canal was propos'd, to crofs this canal at Horninglow near Burton, and again near Burslem; in 1797, an extension of the Aflow-de-la-Zouch canal to join this at Horninglow was propos'd; the design of the two last proposals was, an extension of the wide canals for 40 ton boats, and with the fame view a plan was, in 1797, mentioned of widening
widening this canal and its locks, bridges, &c. so that wide boats might pass between Bradley-Heath, and the call-end of Harecastle tunnel.

**Tweed River.** This river seems to be navigable but about 1 mile from the sea to Berwick bridge, between Berwick liberty and a detached part of Durham county. Berwick is the 8th British town with a population of 7,187 persons; it has a great trade in salmon, which are caught in great quantities in this river, and 40,000 kits if it have been pickled and sent off from this town in one year; 75 to 80 vessels are employed in fisheries, and the trade of this place connected therewith. At Berwick there is a flood bridge 94 feet long, with 15 arches over this river. At Kelso several miles higher up on this river, a flood bridge was, in 1768, washed away, and a call-iron bridge was proposed to be erected in its stead.

**Tyne River.** Acts 9 and 10 Henry V., 6 and 7 William III., and 41 Geo. III.—The general direction of this river is nearly W.S.W. by a crooked course of about 14 miles between Durham and Northumberland; the tide flows through its whole length; its great object is the export of coals. Newcastle-upon-Tyne is the 10th British town with a population of 36,666 persons, South Shields is the 67th with 8,108 persons, and North Shields the 88th with 7,280 persons; Gateshead is also a considerable town near this river, which commences in the North Sea at Tynemouth, and terminates at Blaydon in Winalton. A very peculiar kind of vessels, as before mentioned, is in use upon this river for carrying coals from the wagggon-roads, or railway's, and flatboats to the ships; these are called keels, and are limited (by 11 and 15 Geo. III.) to 25 tons of laden, or 8 Newcastle chaldrons of coals. From an humane set of Gentlemen refusant upon, and concerned in the trade of this river, originated the idea, and they offered a public reward for the life-boat, which Mr. Greathead brought to perfection, and first tried at the mouth of this river on the 30th of January 1790. (See the article Life-boat.) The coals from the numerous coal-mines near this river were formerly delivered to the colliers or coal-ships lying below Newcastle bridge by means of the keels, but of late years several mines have been opened on both sides of the river, and the railways therefrom are conducted to flatboats or spouts on the quays, by which means the coals are shot at once into the holds of the ships. Wooden railways were, since about the year 1685, in use between the mines and this river; one of them of considerable length, the same being a great means of coals, to ship them to many parts, are usually shipped from this river for London, amounting to 700,000 chaldrons annually: see Edington's Essay, &c. p. 31. On some of these mines, immensely large steam engines are employed; in 1758, a new engine was erected at Walker collory, with a cylinder 74 inches diameter and 10 1/4 feet long, which weighed 6 1/2 tons, and was calculated to lift 500 cwt. of water by each stroke of its pump. There is an ancient stone bridge of 9 arches over this river, which was greatly damaged by a flood in 1771; in the year 1801, it was suggested to remove as many of its piers as would form a 144 feet opening near the north bank, and to construct an iron arch over the same, high enough for the keels to pass without lowering their masts. The conservators of this river, in pursuance of the laws of the above acts, have deepened and improved the same and its quays; in 1801, a new dry, or graving-dock, was opened at South Shields, capable of receiving ships at high tides; in 1828, an act passed for building a new light-house at Tyne mouth with reverberating lamps, instead of a coal fire blown by bellows, before used.

In the year 1796, it was proposed to make a tunnel or coal-arch under the Tyne river from North to South Shields for the passage of carriages and passengers, and the expense thereof was estimated at £6,875. In 1797, the Newcastle and Carlisle canal was proposed to join this river near Newcastle; in 1798, the Newcastle and Haydon bridge, and in or before 1861, the Newcastle and Maryport were also proposed. In 1797, and again in 1802, the Durham and Chester-le-Street canal was proposed to join this river near Gateshead; and in 1803, the Tyne and Berwitt canal was proposed through part of nearly the same tract.

**Tyne and Berwitt Canal.** In 1803, it was proposed to make a canal from the Tyne river, near Gateshead, through Gateshead, Winklum, Lamley, and Birtley townships, to Beamish iron works and coal-mines.

**Ulverstone Canal.** Act 33 Geo. III.—The direction of this short, but large canal, is nearly N.W. for 44 miles in Lancashire; it is level with high-water at ordinary tides, with a sea-lock at its entrance; its object is to admit ships to Ulverstone town. This canal commences at Hammer-fide hill in Morecambe bay in the Irish Sea, and terminates at the new wharf and wharfs at Ulverstone; the canal is 65 feet wide at top, 50 feet at bottom, and 15 feet deep; the lock is 112 feet long; at the lowest ebb tide there is a depth of 9 feet water at the gates, and at spring tides of 20 feet; a public swing-bridge is built at Hammeride. That able engineer, Mr. John Rowie, was employed on this canal, and completed it about July 1797. This company was authorized to raise 7,000l, the amount of their shares being 50l. each. Coals may be brought to this canal from the Lancaster canal, without paying the sea duty; some iron works have been established near Ulverstone since the opening of this canal.

**Uppingham Canal.** In 1793, it was proposed to make a canal from the town of Uppingham in Rutlandshire, to connect with the Leicestershire and Northamptonshire Union canal, and provision is made in its act (53 Geo. III.) for such junctions.

**Uske River.** The direction of this river is nearly N. for about 4 miles in the county of Monmouth; the tide flows through its whole length; its objects are the export of coals, iron, &c. and the trade of Newport; at Pill-Gwenni it connects with the Monmouthshire canal, and with the Sirhevy tram-road; it commences in the Severn river at Nail, and terminates at Newport bridge.

**Wakefield and Hullis.** In September last (1825) notices were given for a railway from the Calder and Hebble navigation at Bottom boat in Wakefield, to Hullet-hall colliers, with branches to Bridal and Smifin bridge in the west riding of Yorkshire.

**Warwick and Birmingham Canal.** Acts 33 and 36 of Geo. III.—The general direction of this canal is nearly N.W. for 25 miles in the counties of Warwick and Worcestershire; it crosses the grand-river without a tunnel; its objects are the supply of Warwick with coals, &c. and forming part of the most direct water communication between Birmingham and London; at Kingwood in Rowington, this canal is joined by a branch from the Stratford canal, Birmingham is the 6th British town with 73,670 persons, and Warwick is the 107th with 5,775 persons, on the line of this canal; which commences in the Warwick and Napton canal in Budbrook parish near Warwick, and terminates in the Digbeth cut of the Birmingham and Fazeley canal at Digbeth near Birmingham; it has a cut of 1/4 of a mile to the
the lev in Salteford in Warwick. From the Warve and Napton canal, about 4 miles, to near Budbrook town, 5 level; thence 24 miles to Hatton, a rise of about 20 locks; thence to the Stratford branch, about 5 miles, is level; thence to Knowle common, about 41 miles, is level; thence to Knowle-wharf, 1 mile, is a fall of about 5 locks; thence to Deritend, about 10 miles, is level; thence to the Digbeth branch of Birmingham and Foxley, 14 mile, is a rise of about 5 locks. At the termination at Digbeth a stop-lock is erected, which the Birmingham and Foxley company may fall upon, whenever the water in this canal is of 6 feet depth at such lock. At Hafcra there is a tunnel of 500 yards in length; at Henwood wharf there is an aqueduct over the Blythe river; near Flint Green another over the Cole river; and near its termination at Digbeth another over the Rsa river. In May 1756, the northern end of the canal for about 9 miles to Henwood quay was completed and opened; and, on the 19th of December 1759, the whole line was completed and opened; and, on the 30th of April 1759, a bank of this canal broke, it was filled, and the flow of the waters did some damage. This company was authorized to raise £85,000, the amount of their shares is 100, each. The rates of tonnage will be found in Mr. John Cary’s Island Navigation, pages 56 and 57; paving stones, road-materials, and marrals for adjoining lands, except lime, are to pass free on the pounds, or through the locks when the lock is open; all boats, not exceeding 5 feet wide, may be used by occupiers of lands; boats less than 100 feet long, or with less than 20 tons of lading, are not to pass the locks without leave. The Birmingham and Foxley company are allowed to take 6s. per ton on all goods which pass from this canal to this, until they have paid off £3,600 of their debt, after which they are to take only 5s.; they are also allowed 3d. per ton on all goods passing from this canal to that.

Warwick and Napton. Act 34 and 36 Geo. III.—The general direction of this canal, (at first called the Warwick and Braumin, is nearly Eas, for about 15 miles, in the county of Warwick: it is considerably elevated, and terminates near to the grand-ridge, on its Weft side: its main object is, the opening of the moat of the line between Birmingham and London. Warwick is the 107th British town, with 5,773 persons; Southam is also a considerable town near to this canal; which commences in the Warwick and Birmingham canal, in Budbrook parth near to Warwick, and terminates in the Oxford canal at Napton on the-hill; near Warwick it crosses the Avon river, on an aqueduct; near Radford and Long-Rington there are smaller aqueducts. This canal is level with the Warwick and Birmingham canal at their junction, and is entitled to the waste water from that canal. This canal was completed on the 15th of December 1759. The company were authorized to raise £150,000; the amount of each share being 1000, but by the last act above, the holders of the original 1000 shares, were authorized to contribute any further sum, and to be entitled to a proportionate dividend, with original shares, on such addition. The tonnage rates are adapted to the principle, of making goods pay a higher rate for short distances; see John Cary’s Island Navigation, pages 59 and 60: paving-stones, road-materials, and marrals for adjoining lands, (except lime,) are to pass free on the pounds and through the locks when the water runs waste thereat. Boats less than 70 feet long, or with less than 20 tons of lading, are not to pass the locks without leave. The Oxford canal company are entitled to a variety of rates on goods passing out of this canal into that, which fee in Cary, as above.

Waveney River. The general direction of this river is nearly S.W. by a bending course of about 23 miles, between the counties of Suffolk and Norfolk; it is not greatly elevated in any part; its objects are the import of coal, deals, &c. and export of agricultural products; Yarmouth is the 28th British town, with a population of 14,855 persons; Becles and Bungay are also considerable towns, on or near this river; which commences in the Tare river at Bawdsey, and terminates at the town of Bungay.

Wear River. Act 31 Geo. II.—The general direction of this river is nearly S.W. for about 16 miles in the county of Durham; it is not greatly elevated in any part; its principal object is the export of coal. Sunderland is the 37th British town, with 12,413 inhabitants; Durham is the 7th, with 7,530 persons; and Bishop Wearmouth is the 97th, with 6,126; Monk’s Wearmouth and Chester-le-Street are also considerable towns, on or near this river; which commences in the River Wear near Sunderland to the north side of the river in Monk-Wearmouth. On the 9th of August 1756, a grand iron bridge of one arch, 236 feet span, and 100 feet high above high-water mark, was completed over this river at Wearmouth near Sunderland, as we have already mentioned in this article, and in our article Bridges. The importance of this bridge, besides its advantage in admitting ships further up the river, will appear from the tolls for passing over it, having been let for the current year at 208l. At the mouth of this river there are two piers for the improvement of Sunderland harbour; in 1762, a new light-house, 70 feet high, was built on the North pier, furnished with reflecting lamps; during tide-time every night, another light is exhibited below the principal one, as a notice to ships of the proper time to enter the harbour. In 1797, and again in 1802, the Durham and Chester-le-Street canal was proposed to join this river near Chedder, and hence extend the navigation to Durham.

Wear River. Acts 7 Geo. I. and 34 Geo. II.—The general direction of this river is nearly S.E. by a crooked course of 20 miles in Cheshire: it is but little elevated in any part; its objects are the import of coal and Cumberland iron-ore, and the export of felt and agricultural products; Frodsham, Northwich, and Middlewich, are considerable towns near this river; which commences in the Mersey and Javel navigation, near Wetton, and terminates at Winsford bridge: the rise is about 433 feet by 10 locks: the boats are from 50 to 100 tons burthen: the trustees for this navigation were authorized to borrow money at 5 per cent. interest, and 50 per cent. for the river: in 1759, the debt amounted to £20,000, borrowed at 5 and 5½ per cent.; this debt has long ago been paid off; and, there being no private interest in the concern, to the amount of 3000l. has been paid in some years, to the county treasurer of Cheshire, to be laid out in amending and repairing the public bridges, and
and in the repair of high-ways leading to the salt-works, agreeable to the directions of the first act. The salt-mines at Northwich are 300 feet deep. In 1663, it was in contemplation to make a cut to this river, from near Frodsham, into the Mersey at Warton or Warton point, for avoiding the bar or flood at the mouth of this river.

**Welland River.** Act 51 Geo. III. - The general direction of this river is nearly N.W. for about 37 miles in the county of Lincoln, and skirting the county of Northampton; it is not much elevated above the sea in any part; its objects are the import of coals, deals, &c. the export of Ketton free-borne, Collywobblers, white flutes, agricultural products, &c.; near Crowland it connects with Cawenham, a branch of the New river. Bolton is the 10th British town with 226 inhabitants; Spalding, Crowland, Market-Deeping, and Stamford, are also towns of some note on this river; which anciently was navigable for considerable vessels, from Fossdyke-wath to Spalding; but owing to the confluent changes, which have been taking place in these surprising fens, and their outfall into the wash, we learn, that in 1678, there was not 6 inches' depth of water at low tide in the channel, 2 miles below Spalding; so that when the commissioners of fens inspected the same, their boat was obliged to be carried in a cart upon the fens for 3 or 4 miles below that town. In 1721, Mr. Nathaniel Kinderly (see his Ancient and Present State, &c. page 83) recommended the cutting of a new channel, from near the mouth of Glen river to Wyberton near Bolton, by which the outfall of this river would be into the channel of the Witham river, instead of Fossdyke-wath. The subsequent contractions of the Welland river, by embankments near its mouth, some what improved the navigation to Spalding, and delayed until the year 1794 the adoption of Mr. Kinderly's proposed cut: in future the commencement of this navigation is to be in the tide-way of the Witham river at Wyberton roads, and it terminates at Stamford bridge. The new cut is to commence near the Ship athoue in Wyberton, where there is to be a sea-fluice against the Witham, for the river and flood waters, with gates pointing to sea and to landwards; the threshold of this sluice is to be one foot below low water mark, and it is to be 50 feet wide in the clear; adjoining to the sluice is to be a tide-lock, for the use of the navigation, 60 feet long, and 8 feet wide, in the clear. From this sea-fluice, the cut is to be continued westward, with a regular gradient in its bottom, to a point below the fall of Velmar's sluice, and is to terminate in the old Welland river, near Hooton's Gibbet: the width of the bottom of this new cut is to be 50 feet, and the sides are to be 2 feet for 1 in height; at the distance of 50 feet from the edge of this cut on the South side, and 30 on the North side, banks 11 feet in height are to be made, to retain the floods and prevent their overflowing the adjoining fens, a precaution which has been adopted through the whole course of the fens. Meffrs. John Hudson, George Maxwell, and Edward Hare, are appointed commissioners for setting out, and employing proper persons to execute the new cuts, sluices, locks, &c. and are to cleanse the channel of the Welland for some distance above the new cut, and erect a sufficient dam across the river below the entrance of the same, at Shepherd's hole, to float the tide waters and turn the land waters through the new cut; the rates of tonnage for navigating of which, will be found in Phillips's 40th History, A. p. page 179. A bridge is to be built over the new cut at Fossdyke Inn: at Crowland, there is a most ancient and curious bridge on this river, springing from three different abutments, and meeting in the middle. See our article Bridge.

In 1797, it was slated that 10,000l. had been vitupered for carrying the above new cut and improvements between; and we hope that in less than three years will be completed. There are 39 miles of canal in the above cut, including the towns and maintaining the work when completed by the subscribers. The greatest part of the course of this navigation from Spalding to near Pilgrim's period, and from Market-Deeping to Stamford, is by gradual cuts, on the north side of the old river, for avoiding its imperfect channel.

**Welford and Longford.** About the year 1704, a canal was proposed from the Montgomery canal and River Burr near Welford, to the Longford canal at Welford; pulling Whipp's-Calle and Ludlow in its course.

**Wey River.** C. The general direction of this river is nearly N.S. for 22 miles in the county of Surrey; it is not greatly elevated; its objects are the import of coal deals, &c., and the export of chalk and agricultural produce; at Weyley near Weybridge, it is joined by the Bifhambridge canal. Godalming, Guildford, and Chertsey, are considerable towns on or near to this navigation; which commences in the Thames river at Ham-Faw near Weybridge, and terminates at the town of Godalming. From the Thames to Guilford bridge, 1 ½ miles, is a rife of 862 feet; in this part the channel of the river was very early improved by slip cuts, and pound-locks, (said to be among the first erected in England, and to have been introduced by Sir Richard Wharton;) from Guildford bridge to Godalming, is a canal 42 miles, with a rife of 345 feet, which is supplied by a feeder from the Wey at Godalming. In 1791, and again in 1803, this navigation was proposed to be joined near Godalming by a canal from the Icking river, (see Portmouth and Croydon.) In 1803, the Grand Surrey was proposed to be extended to this river near Welley, and in 1802, a branch from the Grand Junction canal was intended to connect with this river by means of the Thames at Ham-Faw.

**Wharfe River.** The general direction of this river is nearly N.W. for about 5 miles, between Ainly Liberty and the West Riding of Yorkshire; it is not much elevated above the level of the sea: its objects are the carriage of coals, free-borne, &c. and the export of agricultural productions. Tadcaster and Cawood are considerable towns on or near to this river, which commences in the Osfe river near Cawood, and terminates at the town of Tadcaster.

**Whitby Haven Brooke.** This brook is navigable but a very short distance, in a S.E. direction at its mouth, which is wide, constituting the harbour of Whitby in Cumberland: its chief object is the export of coals, lime, and freestone. This harbour, situate on the Irish sea, has had several acts passed for its improvement, viz. 7 and 10 Anne, 13 Geo. III., 1st, 2nd, 28th, 32d, and 45. Geo. III., and in September last (1805) notices were given for a further application to parliament. Whitby is the 6th British town with 8,743 inhabitants. Mr. John Smaton was consulted in 1763, on the building of a north pier, and extending the southern one with 200 feet of it. In 1796, a violent storm happened, which considerably damaged the quays of this harbour. There are several railway lines from this harbour, to the famous coal-mines in its vicinity. On the 4th of August 1728, the first rail or wagggon-way was opened at this place, leading to Harriithwaite and Woodhouse collieries. In 1802, the Henshaw lime-works were opened. On the 9th of August 1803, the railway, 700 yards in length, passing over Bramley-arch, or Road-bridge, to Howgill and Whingill coal mines, were opened: and in the same year thefe to Brackenhaw- waite mine were opened. On 23rd March last (1825) the William Pit, at 750 yards distance from the north wall of the harbour, was opened. Some of the veins of coal in these pits are 7½ to 12 feet thick, and from the whole of them 500 tons or upwards of coal are raised daily: one of these...
miles extends 1/2 of a mile under the sea, at about 600 feet beneath its bottom; inclined planes, 100 fathoms long, being used, for drawing up boxes of coals and others of water, from the extremities of these workings under the sea, to the bottoms of the shafts; these boxes are drawn up the planes by horse gins; for which purpose, and dragging the coal-waggons to the shafts, 100 horses are constantly employed under ground in these pits. The fire-damp often proves fatal to the men and horses employed in these works.

There is a fine white fine-flint quarry on the west side of the harbour.

Wibby and Dewbury. In 1802, a railway was proposed from the Calder and Hebble navigation at Ravensbridge in Dewbury, to Lowmoor iron-works in Wibby, about 7 miles in length.

Wilden and King's-Bromley. In 1760, the line for a canal was surveyed by Mr. James Bridley and Mr. John Smeaton, from the Trent river at Widken ferry to King's-Bromley near Litchfield, 25 miles, with a rise of 115 feet by 39 locks, with a branch therefrom to Longridge near Burton, 30 miles, with 1662 feet rise, by 28 locks; from which last a level branch was again proposed of 33 miles, to Newcastle-under-line: another branch of 25 miles, to Litchfield mill-pool, 18 feet rise, and 3 locks, and thence 1/2 of a mile farther with 30 feet rise, and 5 locks: another level branch was proposed of 10 miles, to Fazeley near Tamworth, and thence 1/4 of a mile, to the Tame river, 17 feet rise, by 3 locks. This canal was intended to be 24 feet wide, and 24 deep, with fords instead of bridges: the estimate was 100,000l. Mr. Smeaton suggested an extension of this canal, over Harccefell-hill, by deep-cutting, withorefiers and steam-engines, for supplying the summit. The Trent and Mersey, Notts-Corps, and Coventry canals have since accomplished what this scheme had in view.

Wilts and Berks Canal. Acts 35 and 41 Geo. III.

The general direction of this canal is nearly N.E. by a bending course of about 52 miles, in the counties of Wilts and Berks: it crosses the grand ridge at the foot of the chalk-hills without any tunnel: its objects are the import of coals from both its extremities, the export of farming products, &c. Abingdon, Wantage, Swindon, Wotton-Baffet, Chippenham, Calne, Melksham, and Trowbridge, are considerable towns on or near to this canal, which commences in the Kennet and Avon canal at Semington, and terminates in the Thames and Iffy navigation at Abingdon. It has a cut of about 1/4 of a mile to Chippenham, one of about 3 miles to Calne, and another of about 1 mile to Wantage: the summit-level extends from near Wotton-Baffet, to the extremity of Wilts. The locks are calculated for long, narrow boats. On the Calne branch there is a short tunnel, under the road at Cuningham park: and a principal aqueduct-bridge over Broadtown brook near Wotton-Baffet. The rise of the road over the canal bridges is nowhere to exceed 3 inches in a yard; the springs and streams within 2000 yards may be taken; the use of inclined-planes instead of locks is provided for in the act; but they will not be necessary, the canal being generally cut through clayey soils that have plenty of water: half-mile flumes are to be erected on the canal banks. The company have been authorized to raise 311,360l. the amount of shares being 100l. each. The inhabitants of Calne made an offer, in Augull 1799, we are told, to cut the branch to that town, on being allowed the tolls thereon for so doing. In Augull 1799, the western end of the line was completed and filled, and on the 1st May 1801, by the completion of the Aqueduct between the Avon to Semington, the junction was formed, and 22 miles of the line to the aqueduct near Wotton-Baffet; with the Calne and Chippenham branches, have since been used, principally in bringing in Somersetshire coals. In September 1800, two branches of the Thames and Severn canal, by Parlingdon and Highworth, were proposed, to join this canal at Uffington and Shirehampton. In 1802, the Aylebury branch of the Grand Junction canal was proposed to connect with this canal by means of the Iffy river at Abingdon.

Winford and Stockton. In 1708, Mr. James Bridley and Mr. Robert Whitworth surveyed the line for a canal from the Tes or river at Stockton in Durham county; passing Hartburn, Coatham-Neb, Monk-hunter, Oak-tree, Maidendale, Bank-top, Darlington, Cockerton, Lower-Walworth, Long's-croft, Killery, and Stanhope, to Winford; with a branch 1/4 mile from Lower-Walworth to the Tes at Pardon-bridge; another from Darlington, 3 miles to Croft-bridge on the Tes; and another from Coatham-Neb, 2 miles to the Tes at Yarm. The rise from Stockton to Winford is 328 feet. A feeder was to be taken from the Tes river, 3 miles above Winford. The export of coals, lime, and lead, was the object of this proposed canal.

Wibbeach Canal. Act 34 Geo. III.—The direction of this canal is nearly S.E. for 6 miles, in the counties of Cambridgeshire and Norfolk: it is but very little higher than the sea, being embanked through the level fans: its object is a communication between Wibbeach and Lynn, instead of an old part of the Nene river near it, which is almost grown up. Wibbeach is the only considerable town near this canal, which commences in the Nene river at the old sluice in Wibbeach, and terminates in the Nene river again at Outwell (at the commencement of Well-creek, a branch of that river leading to the great Ouse river): it is straight and level, having flood locks at its extremities. This company were authorized to make 20,000l. the amount of each share being 10s. All goods entering or passing out of this canal are to pay 3d. per ton, except government stores and baggage, road-materials, machinery, and materials for the use of the Pen-Corporation; husbandry boats may also be used toll free, but not pass the locks. The commissioners for the Nene navigation are to have 100l. out of these tolls, and the remainder, after paying interest on the debt, is to be applied in the repair and improvement of Well-creek.

Witton (old) River. Act Geo. II.—The general direction of this river is nearly N.W. for about 41 miles in the county of Lincoln; it is but little elevated above the sea in any part: its objects are the import of coals, deals, &c., the export of farming products, and forming part of the inland communication between Lynn and Hull. Liverpool, Manchester, &c. Near Tatterhall it is joined by the Hornsedge navigation; at Chapel-hill by the Steaford navigation and at Wyberton roads the new outlet and navigation of the Welland river are to join this river. Lincoln is the 7th Britifh town, with a population of 7,308 persons, and Bolton is the 102d, with 5,926 persons; Tatterhall is also a considerable town near this river; which commences at the Scap or Sculp in the tide-way of Bolton deeps in the Wash, and terminates in the Fosdyke canal, or new navigation at Brayford Meres. This river below Bolton, about 4 miles, was anciently so deep, and was so much frequented by ships, that in the 6th year of King John, when the merchants of London paid only 8d. as a tax on their lands and goods, Bolton contributed 7s. At a gradual decay and silting up of the channel and harbour took place to such a degree, that when in 1761 Melfs. John Griseley, Langley Edwards, and John Smeaton examined the state of this navigation, and of the quacks used on the lining fans, through which this river is embanked on both sides through nearly its whole length, owing to the long neglect of the banks, which should have confined the returning tide and the land-waters, so as to lower the channel, they reported that 20
ton barges could then nearly reach Bolton, while the navigation above that town was entirely lost, and the ancient channel was in several places entirely grown up and abandoned by the water, in its ordinary state. Mr. Smeaton then recommended the erection of a cau-disque upon this river below Bolton, the fill thereof as low as low-water, with 3 openings, amounting to 50 feet wide; these to be furnished with doors pointing to sea-ward, and draw-gates behind them gauged, or having their tops, two feet below the surface of the lens, for always retaining a proper quantity of water in the river in dry seasons; also a sea-lock at the same place for the navigation, furnished with three pair of gates, two of them pointing to the land and one to the sea; the straightening, enlarging, and deepening of the river above Bolton to 80 feet at top, 50 at bottom, and 10 feet deep, were recommended, and the erection of three pound-locks, furnished with flood-gates or opening-ways adjoining, below Lincoln, and one other inch lock above. The estimate for such works as related to draining, was £8,000, and for the navigation works £7,370. It was remarked that Lincoln high-bridge had but 15 1/2 feet clear width of water-way, above which a hard gravelly place, probably an ancient ford, called Brayford head, covered frequently with only 3 feet of water, acted as a weir for holding up the waters of Brayford mead and the Fosdyke canal. When Mr. Smeaton was afterwards consulted in the year 1782, he objected to a navigation lock which had been in the interim erected below Lincoln town, and recommended the cutting off the communication between Fosdyke canal and Brayford mead, by a pound-lock with gates pointing to the canal, and to deepen this river through and above Lincoln bridge, and to remove Brayford head, so as to lower the water in Brayford mead: the principal wharfs appear to have been since made, and the trade of Lincoln is now carried on upon this mead or water. By the acts of 2 Geo. III. for Howdcroft and Skawford navigation, those companies were required to contribute equally with this company in the expenses of deepening and improving this river through Lincoln high-bridge, and thence to the Fosdyke canal, in the next 7 years; in consequence of which, goods paffing on this river to or from the Fosdyke, or Skawford navigations, are to pay only half the accustomed rates on this river. In 1803 it was in contemplation to further improve the navigation of this river below Lincoln. Much has been written on a prohibition said to exist against the shipping of coals from this river, on account of its preventing a rivalry with Newcastle and Sunderland coals in the London market, by the produce of the Yorkshire, Derby, and Nottingham mines being brought by the Trent, the Fosdyke, and this navigation, to Bolton deep; an expectation not much better founded, we fear, than that the opening of the Skawford canal would have any effect on the London coal-market.

Worcester and Birmingham Canal. Acts 31, 38, and 44 of Geo. III. — The general direction of this canal is nearly N.E. for 29 miles in the counties of Worcester and Warwick; it crosses the grand-ridge by a tunnel; its objects are the export of coals, and a more direct communication between Birmingham and the Severn river; at Selly Oak it is joined by the Dudley canal, and at Kings Norton by the Stratford canal. Birmingham is the 6th British town, with a population of 75,670 persons; Worcester is the 40th, with 11,325 persons; Bromgrove and Droitwich are also considerable towns near this canal; which commences in the Severn river at Diggs just below Worcester, and terminates in the old Birmingham, and the Birmingham and Fosdyke canals, at their junction at Farmers bridge at the upper end of the town of Birmingham. From the Severn to Tardebig, 15 miles, is a jile of 428 feet by 71 locks; thence to the Birmingham canal, 14 miles, is level. The width of the canal at top is 42 feet, and the depth 6 feet; the locks are 30 feet long and 15 feet wide; the boats are of 30 tons burden. At Worcester there is a very fine basin for the canal boats. There are 4 or 5 principal, and several smaller cutlets; the principal tunnel at Well Heath is 2500 yards long, 60 feet high, and 114 feet wide below the arch, the depth of water therein is 75 feet; at Tardigbe is another of 700 yards in length; at Shortford is another of 390 yards in length; at Oddingley one of 120 yards; and, at Edgbaston another of 110 yards in length; four of these tunnels are upon the summit-pound. Near Cotton-Hackett there is an immense piece of deep cutting; in 1754, Mr. Care's machine worked by a horse at length, was used for excavating the soil, instead of wheeling it out in barrows. Where the summit-pound of this canal connects with the Birmingham, the Dudley, and the Stratford canals; four locks are erected, which the several companies may shut and lock up, when the supplies of this or the other canals fail, so as to endanger the lowering of the summit-pound, to obstruct the navigation. Mr. John Smeaton was one of the engineers to this canal, the scheme of which was laid, and a bill was brought into parliament in 1790, but the opposition of interests, and natural difficulties, of this vast undertaking then proved fatal to it; the great anxiety and fatigue which Mr. Smeaton underwent in this arduous undertaking, are thought to have injured his health, and to have shortened the days of that very able and excellent man. In May 1796, the eastern end of this canal, as far as the Stratford canal at Kings-Norton, was completed. The arching of the Well Heath tunnel was begun on the 28th of July 1793, the whole of it was turned by the 25th of February 1797, (1780 yards of it having been completed in the year 1795) and in March 1797, the navigation was extended through it to Hopwood wharf, and in the following year, the same was extended to the western end of the summit-pound at Tardebig. The company were provided by their two first acts to raise £300,000. 18. 12d. their whole shares being made hereby, of the odd value of 138. 17s. 6d. each; these were said to be depreciated in value already by the cost of the work; but in 1802, they had risen to 46l. each. The last act was for raising a further sum of money for completing the very difficult part of the line, and supplying lockage-water, by beam-engines to pump it up from the Severn, by reservoirs, &c. which yet remains to be accomplished. The rates of tonnage owing to the several junctions with neighbouring canals are very complicated; see Cary's Inland Navigation, pages 68 to 70. Two-pence per ton is charged on goods entering the Worcester basin from the Severn river, to be there unloaded. This company guarantees the future profits of the Droitwich company to the extent of 5 per cent. annually on each share, and those of the Stratford company to 9 per cent. on each share: they are also to compensate the water-bailiff of Worcester for his dues on coals sold on the Severn at Worcester; they are also to pay to George Perrot Esq. as owner of the Stratford Avon navigation, 420l. per annum for lots of his tolls on the upper part of that river by the making of this and the Stratford canal, besides making up any deficiency there may hereafter be, in his rents of 1227l. for the tolls on the lower part of that river. About the year 1793, a branch was proposed, it appears, from this canal near Hanbury-Hall to the Droitwich canal at that town.

Wye River. The general direction of this rapid and romantic river is nearly N.W. by a very bending and crooked course of about 85 miles, in the counties of Monmouth and Hereford, and Brecknock, in South Wales, and flowing the
the county of Gloucester: its northern end is considerably elevated: its objects are the carriage of coals, and the export of agricultural products; at Hereford it is approached very near, if not joined, by the Hereford and Gloucester canal. Hereford is the 83rd British town, with a population of 6,828 persons: Chepstow, Colfew, Monmouth, Ross, and Hay are also considerable towns on or near to this river; which commences in the Severn river at Beccles, and terminates at the town of Hay. The tide often rises in the mouth of this river, to the extraordinary height of 40 feet; Chepstow bridge over the same, is of great height above the water at low tide. In 1802, and again in 1804, it was in contemplation to make a horse towing-path by the side of this river, and by deepening the shallows in several places to improve its navigation. In 1802, theDean Forest railway was proposed to join this river at English-Bichnor, we believe; in the same year notices were given, for an intended rail-way from this river at Hereford, to join the same again opposite to Lydbrook; and in March last (1805) another rail-way was proposed from this river to the Monmouthshire canal.

WYRLEY AND ESSENTING CANAL. Acts 32 and 34 Geo. III. The general direction of this canal is nearly S.W. by a very crooked course of 32 miles in the county of Stafford: it is considerably elevated, and terminates at its western end near, or upon the grand-ridge: its object is the export of coals, iron, and lime, which abound in its course: Wolverhampton is the 33rd British town, with a population of 12,556 persons: Lichfield and Walsall are also considerable towns on or near to this canal; which commences in the detached part of the Coventry canal at Huddersford (near to Whittington brook, and the commencement of the Birmingham and Fazeley canal) and terminates in the old Birmingham canal near Wolverhampton: there is a branch of 5½ miles to Hay-head lime-works; another of 2¼ miles to Lordes-Hay coal-pits; another of near 4 miles at Wyrely-bank collieries, with a branch from this last near 1 mile to Ellington new collieries; there is also a branch ¾ a mile to near Walsall town, which terminates within ½ a mile of the branch of the old Birmingham thereto. From the Coventry canal to near Cannock-Heath reservoir, ¼ miles, is a rise of about 246 feet, by 39 locks; thence to the old Birmingham canal, 15½ miles, is level; the Lords-Hay, Hay-head, and Walsall branches are all level with the long pound: the Wyrely branch rises about 36 feet, by 6 locks, in the first ¾ mile, the remainder thereof is level, and therefrom the Ellington branch rises 24 feet, by 4 locks. This canal is 28 feet wide at top, 16 at bottom, and 4½ feet deep. No water is to be taken from the old Birmingham canal, but a lock is erected at that junction, and this canal is to be constantly kept 6 inches higher than that, or all boats are to be flopped, by a man stationed there for that purpose: the surplus water from this is to be vented into the old Birmingham canal. Lichfield water-works pipes were to be carefully guarded in cutting this branch. Branches of 5 miles in length, by may be made to this canal by the owners of the mines, if they waste no water. Mr. William Pitt was the engineer: and the canal and works were long ago completed. The company were authorized to raise 166,000l. the first 35,000l. in 12½l. shares: on the extension of the canal in 1794, the company, were required to purchase the shares of certain discontented proprietors: the new shares are 10l. each. The rates of tonnage will be found in Mr. John Cary’s Inland Navigation, p. 47 and 48. Less than 20 tons in a boat is not to pass the locks without paying for that lading, except empty boats on their return. In 1792, it was proposed to make a branch to Stow-heath, and two others into Ashmore-park.

YELE RIVER. The direction of this river is nearly W. by a landing course of about 22 miles, in the county of Norfolk: it is not much elevated in any part; its objects are the import of coals, salt, &c. and the export of agricultural products: at Yarmouth this river is joined by the Thyon river, and at Burgh by Waveney river. Norwich is the 11th British town, with a population of 36,545 persons, and Yarmouth is the 58th, with 14,845 persons; there are no other considerable towns near this river; which commences in the German Ocean at Gorleston-fort, and terminates at the water-works and mill in Norwich: at Yarmouth there is a draw bridge for admitting mailed vessels above it. The quay of this port is ¼ mile in length, and in some parts 150 yards in breadth: a curious kind of low carriages called Yarmouth-Carts are used for conveying the goods from the quay to the warehouses. In 1824, St. Michael’s Collany bridge over this river in Norwich city was taken down, and a cast-iron bridge erected by Mr. Froult in its stead. In 1785, and again in 1802, the London Lyon and Norwich, or North London canal, was proposed to join this river at Norwich.

YORE RIVER. Act 7 Geo. III.—This river, sometimes called the Ure river, has nearly a N.W. direction for about 5½ miles in the West, and skirtng the North Riding of Yorkshire: its objects are the supply of Borough bridge and Ripon, and the export of agricultural products: at Muxton it is joined by the Swale river. This navigation commences in the Ouse river at Linton, and terminates in the Ripon canal at Milby. From the Ouse to the Ripon canal, is a rise of 11 feet; at Linton river is a lock, and a dam or weir so made up as to allow of 1 inch per mile in this distance, for a steam navigation. Mr. John Smith was the engineer, who in 1767 referred to Mr. John Smeth- ton for his opinion on the height of Linton dam, and other matters relating to the works then going on.

For further illustrative this part of our subject, we intend to give a map of the British islands, sufficiently large to distinguish all the navigable rivers, canals, railways, harbours, &c.: and having adopted a method, by which the inconveniences of large folding-maps will be avoided, and yet perfect facility be given, of reference from any page of the map to the other, this will probably be the first of a series of maps, for describing more particularly than has yet been done, several useful and curious particulars relating to the topography and present state of our own country.

CANAL, Canalus, in Anatomy, is a term applied to several tubular cavities in the bones, and the soft parts of the body.

CANAL of the lower jaw, a considerable excavation under the sockets of the teeth, in which the nutrient vessels and nerve of the teeth are lodged. See SKELETON.

CANAL of Fontana, a small channel in the ligamentum ciliaris, between the flesserotic and choroidal coats of the eye. See EYE, Anatomy of.

CANAL of Petit, Canaliz Petitionis, is formed in the anterior part of the membrane hyaloidea, round the margin of the crystalline lens. See EYE, Anatomy of.

CANAL of the vertebra, a large tube, containing the medulla spinalis, formed in the posterior part of the vertebrae; and extending from the occiput to the sacrum. See SKELETON.

CANAL in Architecture, is applied to the furrows on the face of, or underneath a chimney, sometimes also called porticoes; and fitted up with reeds or flowers; sometimes to those cavities, flattened or winding, made on the caulicules of a capital. See SOFFIT.

CANALS are also used for the flutings of a column or pilaster.

CANAL of the volutes, in the Ionic capital, is the face of the circumvolutions, inclosed by a fillet.
C À N

CANALE, in Geography, the chief town of a county of the same name in the department of Côte, or island of Corsica, and district of Balita, containing 8,977 inhabitants.

CANALES, in Ancient Geography, a place of Italy, in that part of Magna Graeca called Magna Graeca, 30 miles from Lepanto, near the gulf of Caminum. Anton. Itin.

CANALICICUM aurum, or CANAHICUS, that gold which is dug out of mines, or veins under ground.

CANALICULATA, in Conchology, a species of BULLA, described by Linnaeus, the shell of which is cylindrical, and the whirls of the spine ground. Obs. This is brownish or tesselaceous, clouded with a paler colour. Native place unknown.

CANALICULATUS, a species of TURNO found in India. This shell is fulcated, and transversely frilated; colour white, varied with green, and sometimes chequered; whorls of the spine fix, and very convex. Chemnitz, &c.

CANALICULATUS, in Entomology, a species of Cerambyx (Priarus) found in the West Indies, but rarely. The thorax is cremated at the margin; dorsal groove villose and white; antennae short. Fabr. This interesting species is described by Fabricius from a specimen in the museum of Dr. Hunter; another occurs in the cabinet of Mr. Donovan.

CANALICUM, in Ancient Geography, a place of Italy in the Aurelian Way, in the passage from Rome to Arethusa by the Maritime Alps, 12 miles from Vada Sabbatha (Anon. Itin.) it is also called Canadunum, and is marked in the map of M. d'Anville in Liguria, towards the N.W. of Savo.

CANALIS, in Entomology, a species of BRUCHUS, of a small size, that inhabits India. The colour is somewhat ferruginous; wing-cases black at the tip; tail black; central line white. Fabricius.

CANALIS is used by Surgeons for an oblong, concave instrument, in which to put a broken limb, leg, or thigh. It is made either of brass, wood, or earthen ware, sometimes even of hair fitted with linen cloth.

CANALIS arteriosus, in Anatomy, the vessel which joins the trunks of the pulmonary artery and the aorta in the fetus. See Fetus.

CANALIS carotidus, a canal in the petrous portion of the temporal bone, through which the internal carotid artery enters the cavity of the cranium, and a small nerve passes from the sixth pair to the superior cervical ganglion of the great sympathetic nerve. For the description of this canal, see Skeleton.

CANALIS medius, the canal of communication between the third and fourth ventricles of the brain. See Brain, description of.

CANALIS nafalis, the tube which conveys the tears from the lacrimal bag into the nose. See Eye, Anatomy of.

CANALIS natri. See Vagina.

CANALIS testis. See Vagina.

CANALIS transvers, a branch of the umbilical vein, which terminates in one of the hepatic veins in the fetus. See Fetus.

CANALIS Trochanterius, and CANALIS Trochoideus. See Canal, sphyra.

CANALIS, semicircular, of the petrous portion of the temporal bone. See Ear.

CANALUVII Montes, in Ancient Geography, mountains of Macedonia, so called by Polybius, and supposed to be the same with the Canaliac of Livy, and the Canaliacus montes of Ptolomeus and Strabo; situate in the country called Thrace.

CANANDAQH, in Geography, a port town, like, and creek of America, in Ottoman country and state of New York. It is the five town of the county, lying on the north end of the lake of the same name, at its outlet into Canandaga creek. The lake is about 25 miles long, and broad, and conveys its waters in a N.E. and E. course, 35 miles, to Seneca river. This is the site of an ancient Indian town of the same name, and stands on the road from Albany to Niagara, 16 miles. W. of Geneva, and 75 miles S.W. from the city of New York. It is now a flourishing town. By the late census of 1790, there appeared to have been 291 electors in this township.

CANANEA, a small oblong island of Brazil in South America, belonging to the Portuguese, opposite to the mouth of Araraqui river; on the south of which stands the town of Cananea, guarding the entrance of the bay. The island lies about 37 leagues from St. Vincent. S. lat. 25° 10'. W. long. 47° 12'.

CANANGA, in Botany, Jussieu p. 284. Aubl. Guian. tab. 243. Clas. and order, palmata polygyna. Nat. Ord. Annonas. Jull. Eff. Ch. Petals small, germes numerous, capsules or berries egg-shaped, peduncled, one-seeded. Jussieu observes, that the plant for which Aublet formed this genus, is probably a conger of Sonnerat's uvaria longifolia; Ind. p. 233. tab. 131, and also of Aublet's own genus Aberemoa, whose large berries have short partial peduncles. La Mareck has united Aublet's Cananga to the Limnanthes genus uvaria, which he calls in French Cananga, (see Uvaria Monosperma) and has of course also admitted Sonnerat's uvaria longifolia. Aublet's Aberemoa, which was accidentally omitted in its proper place in this work, is considered by La Mareck as a distinct genus nearly allied to uvaria, but not yet fully described, having been seen by Aublet only in fruit. The fruit of Aberemoa is held by Aublet to consist of a roundish head of dry, egg-shaped, one-seeded, one-seeded berries, supported by a common peduncle two or three inches long. It is produced by a tree which is a native of Guiana, the bark of which is blackish; the wood white and hard; and the leaves alternate, simple, about a foot and half long, and five or six inches broad, lanceolate egg-shaped, acuminate, rather thick, firm, pubescent, entire.

CANANI, in Biography. See CANANUS.

CANANO, in Geography, a town of Naples, in the province of Calabria Ultra; 2 miles S.S.E. of Reggio.

CANANOR, a sea-port town of Hindoostan, on the western coast of Malabar. It was taken possess of by the Portuguese towards the close of the 16th century; and about the year 1500, Almeida, the first Portuguese viceroy of India, obtained consent of the king of the country to build a fort, and to secure it with a garrison. From that time it became a large and populous city, inhabited chiefly by Mahometans, and carrying on a very considerable trade. In the year 1665, it was taken by the Dutch, who, considering the convenience and importance of its situation, established a factory there. The adjoining country supplied abundance of rice, sugar, pepper, and other valuable commodities; so that no less than 200 ships arrived annually in this port. However, the Dutch sold it in the year 1770 to the sultan of Anchediva or Angeleva, for the sum of 100,000 rupees. It was taken by the English, under general Abercrombie, on the 17th of December, 1750. Cananor is distant 15 miles N.E. from Tellicherry, and 100 W.S.W. from Serigapatam. N. lat. 11° 55'. E. long. 75° 14'.
CANANUS, John Baptist, in Biography, one of the refiners and improvers of anatomy, was born at Ferrara, in Italy, in the year 1515, where he acquired so much reputation for his skill in medicine, that he was invited to Rome by pope Julius III., who made him architect, and his principal physician. On the death of the pope he returned to Ferrara, and pursued his anatomical researches. He first discovered the valves of the veins, which were afterwards more completely described by Vesalius. The work by which he is known, of which only four complete copies are said to be in existence, is “Museolus Anatomia Corporis Prima,” 1604. printed, Haller thinks, in 1553, no date, or place named. The figures, 37 in number, are neatly engraved on copper. They represent the muscles of the upper extremities. In the preface, he promises a continuation of the work, which he probably did not finish. He died in 1579.


CANAPlES, in Geography, a town of France, in the department of the Somme; 10 miles N. of Amiens.

CANARA, a country of Hindooftan, belonging to the kingdom of Mysore, about 60 leagues in length along the coast of the Indian Sea, and from 10 to 30 broad. Its principal places are Mangalore, Barcore, Onore, and Cavar, which are all respectively. This district is one of the acquisitions gained from Tipoo Sultan in 1790. Canara has a peculiar dialect, which extends as far as Goa.

CANAR-ATAN, or Great Canar, a village dependent on the city of Cuenca, under the jurisdiction of the province of Quito, in Peru. It is remarkable for the riches contained in the adjacent mountains.

CANARD, in Ornithology, among the French, has the same application as duck with us, and annual amongst Latin writers: vide Buffon, and others. In the common phraseology of France, it literally implies the domesticated duck.

CANARDER, Fr. is a term of reproach, when applied to a hauhois player; implying, when his reed fails, that he quacks and cackles like a duck.

CANARDER, in Military Language, denotes to shoot, fire, discharge, or throw any thing at or on an enemy with advantage, or from a covered, secure, and advantageous situation, as out of a small turret, guerite, or centry-box, from behind a hedge, dike, or fence, between pickets or paille-fades, from walls with embrasures or loopholes, &c.

CANARDIERE, a small turret, guerite, or centry-box, sometimes made of wood, and sometimes of stone. Such boxes, or guerites, are occasionally erected or placed at the faintest angles of works as places of shelter for centenels, and for them to fee from under cover. They used formerly to be constructed on carriages for people to shoot, fire, discharge, or throw any thing from, unseen, in un molested security.

CANARIA, in Ancient Geography. See Canary.

CANARIA, in Ornithology, a species of Fringilla, familiar to every one by the title of Canary Finch, or Canary bird. The species is thus defined: bill and body yellowish white, with the quill and tail feathers greenish. Linn. Fr. Suec. &c.

The canary bird in a state of nature is of a plain grey colour, with the down at the base of the feathers black, or blackish; the tail is somewhat forked, and the legs pale. They inhabit chiefly the Canary islands, but are also found in other contiguous places. Forster observed them at Cape Verd, Fayal, and Madeira, where they are said to frequent watery places, abounding most among the fedges on the banks of rivulets.

M. Adamson remarks that the canary bird, which becomes white in France, is at Teneriffe almost as grey as a linen; but the change he supposes is to arise from the coldness of the climate. The colour is also susceptible of considerable variation from the diversity of its food, from captivity, and especially from the intermixtures with other species. So early as the commencement of the last century, Buffon observes, that bird fanciers reckoned in the single species of canary bird no less than nine and twenty varieties, every one of which was so distinct from each other as to be easily pointed out.

It may not prove altogether uninteresting in this place to enumerate the principal varieties of this fancy bird in the natural order through which they may be traced, beginning with those which approach nearest to the primitive species.

Common canary Finch, of a grey colour with the down black, as in the wild bird found in the Canary islands.

Grey canary Finch, with the down and feet white.

Grey canary Finch, with white tail.

Common flaxen canary Finch.

Flaxen canary Finch, with red eyes.

Flaxen canary Finch, with plumage gosled with a golden hue.

Flaxen canary Finch, with the down fair, or unmixed with black.

Flaxen canary Finch, with white tail.

Common yellow canary Finch.

Yellow canary Finch, with the down yellow and unmixed with black.

Yellow canary Finch, with a white tail.

Common agate coloured canary Finch.

Agate coloured canary Finch, with red eyes.

Agate coloured canary Finch, with white tail.

Agate coloured canary Finch, with the down of the same colour.

Common yellow-dun coloured canary Finch.

Yellow-dun coloured canary Finch, with red eyes.

Yellow-dun coloured canary Finch, with plumage gosled with a golden hue.

Yellow-dun coloured canary Finch, with down of the same colour.

White canary Finch, with red eyes.

Common variegated or spangled canary Finch.

Variegated canary Finch with red eyes.

Canary Finch, variegated with fair or flaxen colour.

Canary Finch, variegated with flaxen colour, and having red eyes.

Canary Finch, variegated with black.

Canary Finch, variegated with black and fine yellow, and having red eyes.

Canary Finch, regularly spangled with black and fine yellow.

Crofled canary Finch.

Canary Finch entirely of a full yellow.

Canary Finch of a yellow colour, mixed with brownish grey or greenish; which last, Dr. Latham observes, he has frequently seen in Chinese drawings, but whether they were caged birds or not he was unable to ascerten.

The above-mentioned kinds of canary birds are again subdivided into an amazing number of varieties, some of which are remarkable for beauty, and others are no less esteemed for rarity, or melody of song. All these may, however, be comprehended under two general heads, the variegated kinds, and those with the plumage plain; or, as it seems they are denominated in London by bird fanciers, the spangled.
Canaria.

gold and the gay birds. Writers observe that the white canary finches are never variegated, neither are the citron coloured; but when the latter have attained the age of four or five years, the extremities of the wings and tail become white. The grey are not of an uniform colour, for there are feathers more or less grey intermixed in their plumage, and in many of those birds the grey is lighter or darker, and more or less inclining to brown or black. The agates are of an uniform colour in general, but liable to vary in the intensity of their hues. Those inclining to a cream colour are still more uniform; the yellow is confluent both in the same bird, and in different individuals. In the variegated or spangled birds those that are of a jonquill yellow are tinged with black, and there is generally a spot of black on the head. There are variegated individuals with all the simple colours above-mentioned, though those of the jonquill colour are such as are more commonly variegated with black.

These varieties are not the spontaneous offspring of the common canary finch; but of that bird crossed with the Ventorun, and Gin, or Serin, two species very nearly allied to the canary finch, and both which inhabit the south of Europe. It is by this means, as well as by pairing the canary finch with the goldfinch, linnet, yellow-hammer, chaffinch, and even the domestic sparrow, that so many varieties are produced. The canary bird proves fertile with the fink-kin and goldfinch, but in this case the produce for the most part proves sterile; the pairs succeed best when the hen bird is the canary, and the cock is of the opposite species. Indeed it has been remarked that the male canary bird will not beget with the females of any of the before-mentioned species, and that the cross breed can only be procured by means of the hen canary. The two birds with which the canary intermingles its breed the best, as already stated, are the Serin, or Fringilla Serinum, and Ventorun or Citril, Fringilla Cetinella. The fern is a bird of small size, being rather less than the common linnet. Its upper masdible is brown, the under, whitish: the plumage above, brown, mixed with yellifh green; beneath, greenish yellow, and having the sides marked with longitudinal spots of brown: the wings are marked with a greenish band: quills and tail brown, edged with greenish grey, and the legs brown. This kind is found not only in Italy, but in Greece, in Turkey, Anitlia, Provence, Langtudoe, Catalonia, and probably in all the climates of that temperature. There are, however, certain years in which it is very rare, even in the southern provinces of France. Its song is agreeable and varied, but the song of the female is inferior to that of the male. The citril finch is larger than the ventorun, and has a louder note; it is indeed remarkable for the brightness of its colour, and for the strength and variety of song. The female is somewhat larger than the male, has less of the yellow in its plumage, and does not sing so well, or rather answers him, as it were, by much syllables. It is found in Provence, Dauphiny, Geneva, Switzerland, Germany, Italy, and Spain. In Burgundy it is known by the name of the canary. The plumage on the upper parts is of a yellowish green, spotted, or variegated with brown; beneath greenish yellow: wings dusky and greenish, and the legs flesh colour. We conceive it right to be thus particular in pointing out the characters of the two latter birds, since they have been most commonly confounded as varieties of the canary finch, which alone is found in the Canary islands; and from which they differ specifically, although in general appearance and manners of life they nearly approximate. It is with those two primitive species that the canary bird is commonly crossed with most species, and from the union of which many of the more esteemed varieties of the common canary bird are produced. They are reared chiefly by the Germans and Italians, both of whom are celebrated for their skill in improving the natural notes of the canary bird by tutition. Most of the canary birds, we are told, that are imported from the Tyrol, have been brought up by parents, the progenitors of which were induced by the Nightingale. Our English canary birds have commonly more of the tit-bird note. The principal place for breeding canary birds is Fuhneck and its environs, from whence they are sent to the Levant, and every part of Europe.

Canary birds are bred in large quantities, both for sale and amusement, in England, as well as in Germany, France, and other countries; and in each of these countries they have, by behoving due attention to the subject, very much improved the breed beyond those imported from the Canaries. They are of different colours, yellow, white, buff, grey, and green, with an endless variety of combinations arising from the different shades of colour in the parent birds. Those brought from Germany are generally variegated, or mottled, and are the least valued, because the heat of the flowers, generally used to warm the boxes in that country, renders the birds bred there tender and short-lived; German birds seldom live above two or three years in this country: whereas the canary birds bred in England in the usual way are bred to live eight or ten years. Olina tells us they commonly live 10 or 15 years; Sakele says 18, and we have known individuals that have survived for a still longer term of years.

The cock of the German kind is highly valued for its singing, having a very sweet note, which it continues for some time in one breath without intermission; and raises higher and higher by degrees, with great variety. In this bird the fore part of the head, the throat, the pinion of the wing, and the rump, in the cock bird, are of a brighter yellow than in the hen, which mark will hold good in all the canary birds, of whatever kind they may be. The cock is also bigger than the hen, his carriage more sprightly and majestic, and he is observed frequently to extend his neck and head in a very brilh and lively manner. The hen sings indifferently, in no case indeed as scarcely to deserve the name of singing. Whenever the cock sings, his throat may be seen to swell, and play all the while he is warbling, but in the hen there is no such motion. The Hon. Daines Barrington has written an elaborate treatise upon the notes of singing birds, in which those of the canary bird are treated upon at some length, and which may be confided with much satisfaction by the curious reader. Vide Phil. Trans. v. 67. See Soe of birds.

Among a variety of other farts, there are two kinds of canary birds in particular that are much esteemed among breeders; namely, those birds which are all yellow, and those which are mottled and have a yellow crown; the former, in the breeding style, being called gay birds, and the latter spangled, or fancy birds. The fancy breed are esteemed the strongest, and have the boldest song. Caricots breeders often match a gay with a fancy bird, and then the produce, partaking of both kinds, are called males, being soft irregular birds, and of no value for feathers, though they may prove as good as any for singing. If you propose to breed gay birds, choose the cock and hen of a clear uniform yellow colour, without being spotted with foul feathers; for these indicate that the breed has some time before been crossed. There are several subscription societies in London, which raise annual premiums for those who rear the finest birds, and who have a pattern bird painted, or engraved and coloured, as a standard of perfection, with his various characters explained in technical terms. The principal test of a good fancy bird confidts in his having a clean cap, i.e. the crown of his head defined by a horizontal line at the level of his eyes, and black, is to be of a clean yellow or white, without being broke or spotted.
will be fed with fish feathers, or a single feather of this description is considered as a drawback from his perfection, though the degree of perfection is seldom found. Add to this, that its birds, whether white or yellow, ought to be as clear from yellow or white feathers. The inner is notched on the back, and lighter yellow help on the belly, the handfeemer he will be delighted. These general characters are equally requisite in the hen as in the cock, besides which there is a casual variety in fancy birds, distinguished either as males or females; the males being those whose crown and bellies are of a clean white or pale yellow, and the junks such as have their crown, and belly of a deep yellow. The fine spangled fort, commonly known as French canary birds, and the mealy ones, are the best to breed with for those who are very curious; because a spangled cock with a mealy hen will produce a more regular spangled feather than if the cock and hen were both spangled, as they would then breed too high upon the yellow.

When individuals of an uniform colour are paired together, their young are of the same colour; a cock and hen that are grey generally produce grey birds; but if a male grey is put to a female white, or male white to a female grey, the brood will be more beautiful than the parents; and as the numbers that may be crossed by such combinations are innumerable, we can at all times produce varieties in shade and tint, that have not appeared before. The mixtures that may be made of the spangled birds with those of an uniform colour increase still more the number of combinations that may be produced, and thus varieties in the species may be multiplied without end. It is no more often happens, that without the aid of fancy birds, we have pretty little variegated birds which owe their beauty to the mixture of different colours in their parents or progenitors, some of which either by their father or mother's side may have been variegated.

With regard to the mixture of other species with the canary bird, the following observations have been collected. The birds that come from the junction of the citril, the siskin, and the goldfinch, with a hen canary bird, are generally stronger than those from a cock and hen canary bird. They sing longer; and their voice is more sonorous and strong, but they are taught with difficulty; the greater part always whistle imperfectly, and it is seldom one can be found that is able to repeat a single air correctly, or without muffing.

When we wish to procure birds from a mixture of the goldfinch with a hen canary bird, the former must be two years old, and the latter one; because the canary bird comes sooner to maturity than the goldfinch, and in general they succeed best when they have been bred up together. But this is not absolutely necessary; neither will the hen that has formerly hatched with a cock of its own species always refuse the male of another species, as father Bougot had an opportunity of ascertaining. I happened (says Bougot) to put four male canary birds to eight females of the same species; some bad feeds poisoned three of the males, and all the females lost their first eggs; I resolved to substitute three male goldfinches taken in a trap in place of the three dead canaries, and I put them into the cage about the beginning of May. Towards the end of July I had two nests of mongrels, which succeeded to admiration; and the following year I had three broods with each goldfinch and hen canary bird. These last in general do not breed with the goldfinch till they are a year to four years old, and seldom after, while with their own species they continue to hatch for nine or ten years. The common variegated female alone will breed with the goldfinch beyond her fourth year. A goldfinch must never be let loose in an aviary, for he destroys the net and breaks the eggs of the other birds. Hence we perceive that the hen canary birds, although accustomed to the males of their own species, will yield to the canary of the goldfinch, and will breed with these birds successfully. Their union with thefe is even as fruitful as with their own natural males, since they lay three times in the year with the goldfinch. It is not so in the union of the male linnet with the hen canary bird; there being in that case only one brood, or very seldom two in the course of the year.

The bastard birds, which proceed from the canary, and the siskin, goldfinch, and some others, are by no means inferior, but mongrels that can pair and propagate, not only with the goldfinches or the canary birds indiscriminately, but also among themselves, and produce offspring that can pair and perpetuate their varieties. But it must be owned that the produce of these mongrels is not so certain nor so numerous by any means as in the pure or unmixed species; they seldom hatch more than once in a year, and often lay eggs that are added. Their successful production depends on many little circumstances that cannot be discovered, far less pointed out. It is said, that among the crofs breeds there are always many more males than females. A female canary bird and a goldfinch, paired by Bougot, produced, in the same year, at three hatchings, nineteen eggs that were all fertile; among which there were only three females, the remaining sixteen being all males. When a person wishes to pair the canary bird with the goldfinch, it will be best to take young goldfinches of ten or twelve days old from the nest, and put them into a nest with canaries of the same age. He should feed them together, and leave them in the same cage, allowing the goldfinch to the same food as the canary bird. It is usual to put a cock goldfinch to a hen canary bird, as they pair more easily, and prosper better than the cock canary bird and hen goldfinch. It must, however, be observed, that the brood in the first case is later, because the cock goldfinch and hen canary bird do not pair so quickly as the canary cock. But when the female goldfinch is put to a male canary bird, the pairing takes place much sooner. To succeed, a male canary bird is never to be put into a cage where there are females of its own species, for then he will prefer these to female goldfinches.

The union of the male canary with the female siskin produces exceedingly well. A female siskin, confined in an aviary for nine years, was known to have for the first five years three broods annually, and for the remainder of the time two broods a year, all of which prospered. Linnets and canary birds have been put together, but they seldom breed unless the cock linnet be put with the hen canary bird; the female linnet will not even make a nest, but drops a few eggs in the cage, which are generally added, so that it is needless almost to compel the hen to sit upon them. The chaffinch and yellow hammer are, with great difficulty, made to pair with the canary bird. A female yellow hammer has been left with a male canary for three years, during all which time the female laid only added eggs; and it is just so with the female chaffinch, but the cock chaffinch and yellow hammer with the hen canary bird have produced some fertile eggs.

It follows from hence, and various other facts, that the siskin alone will breed with the canary bird equally well, whether male or female; the hen canary bird produces likewise easily enough with the male goldfinch; not quite so easily with the male linnet; and lastly, that it will breed, though more reluctantly, with the males of the chaffinch, the yellow hammer, and sparrow, while the male canary is incapable of fecundating the females of any of the last, or at least that the latter very rarely succeeds when paired with them.

The dispositions of canary birds are extremely variable. There are some cocks that are always melancholy, and even fallen, sitting seldom, and then in a dimsl strain; they are long in learning, and learn at last, but imperfectly, what you
reaching them, and that which they acquire they very soon forget. They are often as melancholy that their feet and tail are constantly dirty; and they do not please the female, whom they never regard with their song, not even when their young first appear. There are others so wicked that they will kill the hen they are put to, and the only way to tame them is to give them two females, who join for their common defence, and when they have once vanquished by force, the male becomes tame, and they encourage their caprices afterwards by tenderness and love. Some of the males are so ferocious as to break and eat the eggs when the hen has laid them; or, if this unnatural father allows her to hatch them, the young are fearfully excluded from the shell of the egg, then he forces them with his bill, draws them from the nest, and kills them. Others are so wild and ungovernable, that they will neither allow themselves to be touched nor cared for; they must be left at liberty, and cannot be treated like the others; if they are muddied with in the heat they will not breed; their eggs must not be touched, nor taken away; and they will not hatch if they are not suffered to pair or build as they please. And lastly, there are some of an indolent disposition; such, for example, are the grey ones; these never build, and the portion that attends them must make a nest for them. All these tempers are very different, and very different from favourite canary birds that are well-trained: these are always gay, always singing, agreeable, of a happy disposition, and endowed with the best inclinations.

The bad disposition of the canaries frequently proceeds from mismanagement. When they break their eggs and kill their nestlings, they are oftentimes governed by the impulse of impetuous love, and it is to enjoy the female that the male drives her from the nest and destroys the tender objects of her affection. Accordingly, the best means of making such birds hatch is not to put them into different cages. It is better to place them in a room well exposed to the sun; and to the east in winter, where there are many hens and only few cocks, for then they will enjoy themselves more, and multiply better. When a hen fits, the cock finds himself another mate, and does not disturb her. Besides, the cocks have many quarrels among themselves from jealousy; and when they see any one too ardent as to torment the female and attempt to break the eggs, they beat him so severely as to punish him effectually for his temerity.

When the canaries are about to build, they should be furnished with lint, or flares of linen, hair of oxen, moss, and very small and dry straw. Goldfinches and skylins, if put with hen canary birds, when male birds are wanted, prefer small straw and moss, but the canary birds like hair and lint: these should be cut very small, for fear the threads should entangle the feet of the hen, and cause her to pull the eggs from the nest as the rains from it.

For feeding them, you must place in the room a hopper, pierced all round so as to admit their heads, filled with a portion of the following composition: three quarts of rapeseed, two of oats, two of millet, and two of hemp-seed. Every twelve or fourteen days the hopper is to be filled, taking care that the seeds are clean and well winnowed. This food is proper as long as they have only eggs; but the evening before the young are excluded, they must have a dry cake kneaded without fat, which may be left till it be eaten, and then you may give them eggs boiled hard; a single hard egg, if there are but two cocks and two hens, or more, in proportion to the number of birds. They must have no vegetables while breeding, that would weaken the young too much; but, in order to vary their food a little, give them every third day, on a plate instead of the dry cake, a piece of white bread dipped in water, and pressed with the hand; this bread not being such substantial food as the cake will prevent them from growing too fat when hatching. It will likewise be proper to give at the same time some poppy seeds, but only once in two days, for fear of heating them too much: sugar beetens generally produce this effect, which is followed by another still more hurtful; for when they are fed on beets they often lay addition eggs, or bring weak and sickly young. While they have young, it is recommended to boil their rape, to deprive it of its acrimony.

After the eggs are laid, give the canary birds plantain and lettuce seed to purge them. The food of the nestlings, when hatched, must be prepared: it should be a paste composed of boiled rape seed, a yolk of an egg, and crumbs of the cake mixed, and kneaded with a little water, which is to be given to them every two hours. This paste must not be too liquid, and, for fear of its turning sour and injuring the birds, it should be renewed every day till the young can feed themselves.

Canary birds are distinguished by different names, according to their age. Such as are about three years old, are called uncles; those above two, are named cfeijis: those of the first year, under the care of the old ones, are called branchers: those which are new born, and cannot feed themselves, plofles; and such as are brought up by hand, wijings.

The brood of birds in a state of captivity is not so constant, but it is, perhaps, more numerous than it would probably be in a state of native freedom; for there are hens who will hatch four, or even five times a year, laying four, five, or six, and sometimes even seven eggs at a time; in general, they have three broods, and the moult prevents their having more. There are hens, however, that hatch while they moult, provided they begin to fit before that time. Birds of the same nest do not all begin to moult at the same time. The weakest are the first to undergo that change; the strongest are often a month later. The moult of junquin canary birds is more tedious, and generally more fatal than that of the others. The hens of these junquin birds lay only twice, with three eggs each time; the light-coloured ones, both cock and hen, are too delicate, and their brood seldom prospers. The cream-coloured canaries have some repugnance to pairing with one another, and in a large aviary it almost constantly happens, that a cream-coloured male will make choice of a female entirely of another colour. In general the white ones, however, pair, build, and hatch together, and commonly succeed better than when a white one is paired with another of a different colour.

Notwithstanding the difference in the disposition, temperature, and fertility of these birds, the time of incubation is the same in all. They uniformly fit thirteen days, and when it happens a day less or more, it is owing to some accidental circumstance; cold retards the exclusion of the young, and heat accelerates it. Accordingly, it happens sometimes, that the first hatching in April lasts thirteen days and an half, or fourteen days, if the air is at that time cold; on the contrary, the third hatching, which happens during the great heats of July or August, lasts only twelve days and a half. The bad eggs ought to be separated from the good; but in order to know them certainly, you should wait till they have been fat upon for eight or nine days, then take each egg by the two ends for fear of breaking them, and hold them against the sun, or a lighted candle; those which appear clear are to be rejected as it would only fat the hen to no purpose to leave them in the nest. In thus separating the clear eggs from the complement of three, we may select only sufficient to make up two of

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them; and the third hen being released from fitting, will proceed to lay again. It is a practice much recommended by bird-fanciers, to take away the eggs as the hen lays them, substituting an ivory one in the place of each, that the whole may be hatched together. When the last egg is laid, the ivory ones are removed, and the others replaced. In general, the time of laying is in the morning, about six o'clock; it is said, when this happens an hour later, it is owing to the hen's being sick; the eggs being thus laid in regular succession, it is easy to take them away the moment they are laid. However this practice is more adapted to our own convenience than to that of the bird, and is contrary to the economy of nature: it causes the mother to part with a great deal of heat unnecessarily, and burdens her at once with five or six young which incommodate her more than they give her pleasure, while when she sees them come successively one after the other, her pleasures are multiplied, and her strength and courage supported; accordingly, some very intelligent bird-fanciers assert, that the natural way has always succeeded better than the above-mentioned practice.

In their native country, canary birds haunt the banks of little rivulets and other watery places; we should not, therefore, suffer them to want water, either to drink or bathe in. As they are natives of a very mild climate, they must be defended from the rigour of winter, although from long habit, they are now so far naturalized to our climate, as to live very well during the winter in a room without fire: some breeders accustom them even to live all the winter in a room with the window or windows open, and only guarded with a net-work to prevent their escape. It is seldom that canary birds brought up in a chamber fall sick before hatching; sometimes a few cocks will over-eat themselves and die; if the hen grows sick while she is fitting, her eggs must be taken away and given to another; for though she should get better soon, she will not return to her nest. The first symptom of fickleness, especially in the cock, is melancholy; whenever he is observed to lose his natural gaiety, he must be put in a separate cage, and placed in the sun in the same room with the hen. If his feathers appear rough, you must look if he has not a pimple on the rump; this the bird sometimes opens with his bill, but if not, it should be pricked with a large needle, and the wound anointed with salves, without mixing any salt with it, which would smart it too much. The most general cause of fickleness is too abundant, or too rich food; when these birds are made to breed in a cage or closet, they often eat too much, or select the succulent food intended for the young, and hence arise the ill-effects of repulsion, or inflammation. By keeping them in a room, this may be in a great measure prevented; because, being among a great number, they hinder one another from eating to excess. A cock who eats for a long time is sure to be beaten by the other males; and the same is the case with the hens; these quarrels give them exercise, temperance, and occupation; and it is chiefly on this account that they are seldom or never sickly in a chamber during the breeding time; it is only after hatching that infirmities and diseases attack them. The greater part of them become afflicted with the pimple before mentioned, and afterwards all of them are subject to moult. Some support this change of slate extremely well, and do not fail to sing a short time every day, but most of them lose their voice, and some even die. When the hens have attained the age of six or seven years, they moult with difficulty, and many of them die. Young canary birds moult early in the year: about six weeks after they are hatched they become melancholy, appear rough, and put their head under the wing. Their down falls in this first moulting, and in the second, the following year, the large feathers, including even those of the wings and tail, fall off. Cold weather is unfavourable to the canaries while moulting, and they would all die at this time, were they not kept in a temperate, or rather in a warm place. The usual time of moulting is about six weeks or two months.

The most fatal, and common disease that the young canary birds are subject to, is what is called the fitchet, in which their bowels tend to the extremity of the body. The intelleves are seen through the skin in a state of inflammation, redness, and distention; the feathers on that part fall off, the bird grows emaciated, gives over eating, though he sit by his meat, and dies in a few days. The cause of this disease is the too great quantity, or succulent quality of the food. All medicines are fruitless; diet alone can save a few out of a number of birds thus affected. They must be put into separate cages, and nothing given to them but water, and lettuce-feed; this food is cooling and purgative, it tempers the ardour that consumes them, and sometimes occasions evacuations that save their lives. In short, we may observe, that this disease proceeds solely from our method of rearing these birds. We ought, therefore, to be particularly cautious of over-feeding them, when we bring them up: boiled rape-feed, a little ground meal without sugar, or biscuit, and in general rather too little than too much food is to be recommended.

When the canary bird utters a faint and frequent cry, which seems to issue from the bottom of his stomack, he is said to be athermic; he is also subject to a sort of extinction of the voice, especially after moulting. The aphthosis is cured by administering plantain meal, and hard biscuit soaked in white wine, and the voice may be restored by giving him for food the yolk of eggs mixed with crumbs of bread, and for his drink, water in which lozenges root has been steeped and steeped, or if boiled in it, so much the better. Canary birds are likewise affected with ulcers in the mouth, which are suppoosed to proceed from a supersumbance of succulent food, as in the former cases: these ulcers commonly occasion an inflammation in the throat, and palate, which can only be cured by administering a cooling diet, and for this purpose nothing can be better than lettuce-feed, with a few seeds of the melon bruised, and infused together in water. The impothesis is another disorder to which the canary birds are liable the most approved medicine for this disorder, we are told, is to anoint the root of the head for two or three days with an ointment made of fresh butter and eapon's grasse melted together. After anointing the head three or four times, it should be examined, to see whether the part of his head affected be soft; and if so, open it gently and let out the matter, which will be like the yolk of an egg. When this is done, anoint the wound, and the bird will soon be cured. Unless this precaution be taken, the canary birds afflicted with this disorder are very apt to fall down suddenly and expire. These birds are also infected with a peculiar sort of loath, and scab, owing to the slovenly manner in which they are kept by some people. Care should be therefore taken to have them always clean, to give them water to bathe in occasionally, to be choice in their food, and never to put them into cages of old wood. Thoe cages it has been recommended, to have made either of walnut-tree, or oak with bars of wire. Cages of the usual cylindrical form are objected to as being improper, since they allow the birds very little place.
little room to walk in, and without this exercise they become melancholy; or at least, lose a considerable share of their natural vivacity: the cages that are constructed of a lengthened form, high, and narrow, are the best adapted to the purpose of breeding and rearing this beautiful song-bird, when the breeder cannot devote a room to that object alone.

CANARIENVOGEL, according to Frisch the canary bird: Fringilla canaria.

CANARIE, Fr. a quick dance in jig time. The word is twice used by Shakespeare,—"Canary to it with your feet."—Love's Labour lost.—"And make you dance canary with spirits fire and motion."—W. Shakespeare.

Meroenne gives a specimen of the kind of movement. He says the caribollies are rapid, and the figure extremely difficult.

Purell has canaries in his museck to Dioclesian. The tune is said to come originally from the Canary islands.

CANARI, in Ancient Geography, a people of Africa, who inhabited the district towards the south-east of Mount Atlas. Pliny mentions them, and says, that they eat the flesh of doves.


It differs from Campanula only in number; a difference which, if allowed to be a sufficient generic distinction, will confer many species from the genera in which they have been very naturally placed, and have long quietly flourished. Linn. Mant. 225. Wild. Mart. Linn. fil. Pl. 259. Bot. Mag. 144. Sp. I. C. caneranulta, (C. caneranula, Linn. Sp. Pl. 239. Tourn. 159. Pink. Alm. tab. 276. fig. 1.) "Stem erect; leaves halbert-shaped, in three or opposite." Root perennial, spindle-shaped. Stem three feet high. Herbageous, erect, rather feble, round, even, notty, branched; branches two or three from each knot; upper ones longer, dichotomous at the end; little branches alternate. Leaves on the stem by threes, or three branches opposite, petioled, unequally toothed, even, veined. Flowers from the forks of the upper branches large, peduncled, drooping; corolla reddish-yellow, or orange, brighter at the bottom, with a yellow eye; each segment marked with three purple branched nerves; anthers yellow. A native of the Canary islands, whence the genus, though not very properly, has derived its name. 2. C. Zanguebar, Lour. Cochinch. 1975. "Stem climbing: leaves halbert-shaped alternate." Stem shrubby, round, even, branched. Leaves heart-halbert-shaped, quite entire, smooth, veined, petioled. Flowers solitary, lateral: corolla pale-colored. Capule somewhat egg-shaped, sharp at the base, fix-nerved, opening at the base, seeds heart-shaped, compressed, surrounded by a turbinate ring, odorous. A native of Zanguebar on the coast of Africa.

Propagation and Culture. The seed species only has been cultivated in Europe. It is propagated by parting the roots, which should be done in July, soon after the plants are decayed. It succeeds well in a light sandy loam, with a fourth part of screened lime-rubbish. The pots should at first be placed in the shade, and unless the season be very dry, should not be watered. About the middle of August they should be placed under the hot-bed frame, and as the nights grow cool, covered with the glass. When the plants appear, the plants should be sometimes, but not often, refreshed with a small quantity of water. About the middle of September they should be removed into a dry airy glass-house, where they may enjoy the free air in fine weather, and yet be screened from cold. They flower from January to March, when they should be frequently watered. In spring, when the flowers begin to decay, the pots should be set abroad in the shade and not watered. Miller.

CANARIUM, from canarius, in Antiquity, a Roman sacrifice, wherein dogs of a red and ruddy colour were sacrificed, for a security of the fruits of the earth against the raging heats and disorders of Sirius in the dog-days.


Gen. Ch. Male. Cal. Perianth two-leaved; leaves egg-shaped, concave, permanent. Cor. Petals three, oblong, resembling the leaves of the calyx. Stam. Filaments five, very short; anthers oblong, the length of the petals.


Sp. 1. C. commune. Linn. Mant. 127. (C. vulgare Rumph. Amb. 2. p. 145. Tab. 47.) B. C. Mehemebenthe, Gart. tab. 102. fig. 1. A robustous lofty tree. Trunk covered with a whitish bark; wood whitish, tolerably solid, but not durable. Leaves alternate, unequally winged; common petals flayed; leaflets nine, large, petioled, oblong, egg-shaped, acuminate, even. Flowers whitish, felvile, slightly variegated panicles, which terminate the branches. Gartner affirms that the commune of Linnaeus, and the mehemebenthe are mere varieties of the same species. He has figured the fruit of mehemebenthe, and given the following description. Drupes superior, berried, acuminate-egg-shaped; skin olive-coloured, thin; pulp small in quantity, full of capillary fibres: shell bony, egg-shaped, either slightly pitted or even, trigonous, three-celled, with three obtuse teeth at the tip, marked with three obscure lines on the sides, and perforated through its whole length with a thread-shaped auxiliary canal. Seeds oblong-egg-shaped, two in each cell, only one of which comes to maturity. The drupe of the other variety is a little larger, and the pulp without fibres. The shell is more sharply triangular, and its sides are perfectly smooth, nearly flat, without the middle raised line. The fertile cell and seed are also larger. In the oldest feeds Gartner never found the kernel rancid, but always fresh, with a flavour resembling that of fresh almonds which, as he observes, is the more remarkable, because the cotyledons, when the integument of the seed is stripped off, seem beaummed with oil, are very slippery, and repel water. A native
A native of the Molucca Isles and New Guinea. The nuts are eaten by the natives either raw, or made into a kind of bread. An oil is also expressed from them which is used at the table. When eaten fresh they are said by Rumphius to bring on dysenteries, and to occasion an oppression of the bowels. 2. C. fimbriatus, or Nanarium. Rumph. amb. 2 tab. 49. Gart. tab. 102. fig. 2. Druef defays, infographic egg-shaped, round, not trigonous, as in the preceding; shell egg-shaped, finely, very thick, obscurely trigonous, marked with three depressed longitudinal lines, to which as many small callous tubercles are joined below the top of the shell; cells three, two of which are often abortive, the third very irregular, and lined with a very thick cartilaginous cutis. See oblong, trigonous, curved in the form of the letter S gibbons in contrary directions near each end. The kernel, on account of its singular form and brittleness, cannot be got out entire, unless the shell be opened carefully from one end to the other. 3. C. decamumnum, Rumph. tab. 55. Gart. tab. 102. fig. 2. Druef the largest of any in the genus; shell oblong-egg-shaped, triangular, thin, thick, with fix teeth at the tips; angles prominent, smooth, longitudinally furrowed; sides pitted with numerous oblong depressions as if they had been eaten by worms; auxiliary canal triangular; cells three, large. Seeds wanting in the specimen examined by Gartner. Professor Martin has represented the taft also as only varieties of C. commune: but it is evident, from Gartner’s descriptions and references to Rumphius, that he judged them to be distinct species.

Loureiro calls this genus Pimelea, on account of its oil, produce, but that name has been given for a similar reason to a very different list of plants, natives of New Holland and New Zealand. See Pimelea. Loureiro has added to the commune of Linnaeus, which he calls Pimelea alba, two other species which he found in Cochin-China and its neighbourhood. 4. C. nigrum. Leaves winged; flowers in lateral racemes; nuts two-celled. An oil is extracted from its kernel, not less agreeable than that of the olive, but heavier on the tumb. 5. C. oleiferum. Rumph. vol. i. tab. 54. Leaves pinnate with four pair of leaflets; peduncles lateral, many flowered; nut one-celled. The drupes are eaten like those of the first species; an oil for the table is likewise procured from them. When the bark is wounded, there exudes a yellowish, odorous, oily resin, similar to copal, which is used to varnish household furniture. The pulp is called Damar or Dammar in the East Indies, and used for the caking of ships, is composed of this resin, mixed with the bark of the bamboo reduced to powder, and a little chalk. It is preferable to all other sublances for this purpose with respect both to its durability and tenacity, and has not the smell of European pitch. Bofc. in Nouv. Dict. The trivial name given by Loureiro to the last species is a bad one, not being at all discriminative.

Canarium, in Conchology, a species of Strombus, found in the seas and great rivers in the southern parts of Asia. This shell is somewhat heart-shaped, with the lip round, short, retuse, and with the spire smooth. Linn. 86c. Length two inches and a half; colour yellow, or brown, with transverse fuscous angulated lines; pillar snowly white. The general contour of the shell remarkably vesticeof.

Canarium of Rumphius is the species of Strombus described by Linnaeus under the name of Giberulus.--Canarium is also the name given by Rumphius to the Linnaeian Strombus uncinus, which see.

Canaria, in Geography, a town of Poland, in the palatinate of Saxony; 16 miles W. of Sandomierz.

Canary, Grand, hill known by the name Canaria, given to it by Pliny and Ptolemy; one of the Canary islands, from which the general appellation is derived; situate between Tenerife on the west, and Forteaventa on the east, about 100 miles N.W. from Cape Bojador on the African coast. N. lat. about 27° 30′. W. long. 13°.

This island is about 100 miles in circumference, and the number of inhabitants amounts to 12,000. Pliny says, that it formerly produced a sort of doles, and pine-apples in great abundance. The soil, though light and sandy, is covered with a rich mould, which produces two harvests in the year. The wheat and other corn are reckoned very good; sugar cane are much cultivated; the vines yield those grapes from which the wine called fack, or canary; and the island abounds with excellent fruits, such as apples, pears, melons, figs, peaches of several kinds, and pluots. It has also plenty of horned cattle, flags, poultry, pigeons, and partridges. Wood is scarce. Filtering-stones constitute an article of traffic from this isle, as well as from Forteaventa. The capital of the island, and also of the Canary islands, is Palma or Canary: the other towns are Galdier, Trachana, and Luz.

Canary, called also Palma, in Latin Civitas Palmarum, and in Spanish Ciudad de Palmas, the capital of the preceding island. Although the governor and the chief people of distinction commonly reside at Tenerife, yet Canary is the see of a bishop, suffragan to the metropolitan of Seville in Spain, who usually resides in this town, and has a tribunal of inquisition. The royal audience, or sovereign council of the Canaries, over which the governor presides, is held in this town, and receives appeals from all the other islands. The revenues of the bishop, amounting to 100,000 a year, are almost entirely distributed in acts of charity through all the islands; and the present bishop (see Emb. to China, vol. i. p. 117.) joins to this humane disposition, the rigour of ecclesiastical discipline, and encourages the observance of ceremonies of piety, by offers of indulgence to those who practice them. This town is seated on the south-west side of the island, at a small distance from the sea. Its climate is temperate; its extent about a league in circumference; its cathedral is magnificent; and its houses, though only one story high, and flat at the top, are generally elegant buildings; it has four convents. The number of inhabitants is estimated at 12,000. N. lat. 25° 10′. W. long. 15° 30′.

Canaries, a clouter or groupe of islands in the Atlantic Ocean, situate about 150 miles to the west of the empire of Morocco in Africa, between N. lat. 27° 15′ and 30°. W. long. 13° and 15° 30'. They are generally sup-posed to have been the home with the Inuits, Bente, or fortunate islands of the ancients, particularly described by Ptolemy and the elder Pliny, and so called on account of the singular temperature of their climate, the fertility of their soil, and the excellence of their cultures. Ptolemy, however, if he meant these islands, has placed them 11° too near the equinoctial, or in the 16th degree of N. latitude, whence some have concluded, that this appellation belonged to the Cape de Verdu islands. But Strabo affirms them a situation which agrees with the observations of modern geographers. Some have derived their name from canis, dog, on account of the number of large dogs which were found on the island Canaria or Canary, two of which were presented to Juba, king of Maturitania. Others derive the origin of the name from the Cannaonites, or Phanicians, who are said to have often sailed from the continent to Carne, supposed to be a contradiction of Canary. The number of the Canary islands has been differently stated, both by ancient and modern geographers. Pliny and Ptolemy reckon fix; Plutarch and others mention only two; modern geographers have generally reckoned 13, exclusive of Madiera, which is at a con-siderable distance to the north: but the inhabited islands have
have been reduced to seven, viz. Palma, Gomera, Teneriffe, Grand Canary, Forteventura, and Lanzarota; for each respectively. To these have been added the following six small islands, viz. Lobos, Roche, Grande, Santa Clara, Arleguana, and Inferior, besides a cluster of rocks, called the Sables, between Madeira and the Canaries. Teneriffe, though not the largest, is probably the most fertile of the Canary islands, and its population amounts to nearly 100,000 persons. That of the Grand Canary has been already stated; that of Palma is estimated at 70,000; of Forteventura at 18,000; of Lanzarota at 8,000; of Gomera at 7,000, and of Teneriffe at 15,000; the total according to this enumeration amounts to 106,000; but others reckon the population of Teneriffe at 60,000, and the whole at 140,000. The air of that island is pure and temperate, and the soil is fertile; the produce is wheat, barley, rice, and oats; the excellent canary wine is obtained chiefly from Teneriffe and Palma: Gomera is noted for figs; and the tree yielding the juice called dragon's blood is not uncommon. Fruits of various kinds are of excellent quality, and are cultivated in great abundance. These islands are well supplied with cattle, such as cows, sheep, goats, and wild affes, which run about in mountains in woods; their pastures are floved with varieties of the feathered kind, of which the canary birds are well known; and the surrounding forests are floked with flocks of fift, particularly fuggroes. All the islands have ditches and washes filled with water at spring-tides, and afterwards evaporated by the heat of the sun, so as to yield a fine sea-salt. Flax, aniefelds, and corriander are cultivated in the different islands. Archil and furnach grow spontaneously. See Archil. Kali is found along the sea-shore, and might afford as good soda as that of Alicant. The cotton shrub and also the fugar-cane are much neglected. Potatoes have within the last 30 or 40 years been introduced in these islands; and at present they constitute almost the chief food of the inhabitants. Wheat and barley are grown in November and December, and usually reapd in April and May. The corn is carelessly raked together, carried home in sacks on the backs of assies, mules, or camels, and then trodden out by cattle, and the grain separated from the chaff by exposing it to the wind. The lands are not rented in the Canaries; the landholder furnishes the seed and implements of husbandry, and receives one half of the produce, besides a certain quntity of wheat for each head of cattle, which he lends to the tenant. Bread is only eaten by the richer inhabitants. The people in general habit much on "goffio," which is only parched grain ground by a little hand-mill, of which every cottage possesses one. Those who use better fare have recourse to salt fish and potatoes. The poor inhabitants of Palma and Gomera are sometimes reduced to the necessity of making cakes of the roots of the "petis aquilina" or male fern, which they dig in the mountains. Lupins are a choice food for cattle; but their flowers are previous fermented in water and boiled with the addition of salt. The capital of the fevea inhabited islands is the town of Palma, or Canary, in the isle of Canary.

History gives no certain information with regard to the original inhabitants of these islands. Some say, that they were exiles from Africa, whom the Romans banished thither, after cutting out their tongues, for having blasphemed their gods. But how perfons, deprived of the organ of speech, could form any language, peculiar to themselves, and transmit it to posterity, it is not easy to conceive; and, therefore, this circumstance attending their origin is probably fabulous. It is said, however, that all the descendants of the ancient inhabitants speak the same language, though diversified into different dialects. Their clothing consisted of hides and fising; and they inhabited caves, and rocks in perfect harmony and union. Their food was the flesh of horded cattle, dogs, and the milk of goats; and they prepared a kind of pudding, or hord, of milk and trituated corn, called "goffio," which is now common under the same name. The first discovery, as well as the original settlement of these islands, is involved in considerable obscurity. It appears, however, that they were imperfectly known to the Spaniards, in consequence of some of their piratical excursions, about the middle of the 14th century. Pope Clement VI. it is said, having preached a sermon to prove that he had the sole right of creating kings and felling kingdoms, exercised the prerogative, Nov. 15th, A.D. 1444., of creating Lewis de la Cerda, deputed from the royal family of Castile, king of the Fortunata islands, supposed to be the Canaries; though the new monarch was unable to discover in what part of the world his new dominions were situated. At length, in 1453, or 1455, or, as others say, 1495, some private adventurers from the coast of Biscay extend the piratical excursions as far as these islands; and John de Bethencourt, a Norman baron, obtained a grant of them from Henry III. of Castile. Bethencourt, with the valour and good fortune which distinguished the adventurers of his country, attempted and effected the conquest, and with the consent of the Spanish court, assumed the title of king of the Canaries; and the possession of them remained for some time in his family, as a fief held of the crown of Castile. In 1431 the grant of them was confirmed to John II. king of Spain, or Castile, by pope Eugenius IV.; and in 1493 Ferdinand and Isabella, king and queen of Spain, being before possessed of four of these islands, conquered the island called Grand Canary; and also the two remaining islands; and by the treaty of peace between Ferdinand, king of Castile, and Alphonso, king of Portugal, it was agreed that these islands should belong to Spain, in lieu of the settlements on the continent of Africa, ceded to Portugal: accordingly, they have all remained in the possession of Spain to this day. Those whom the Spaniards found in possession of these islands they denominated Guanches; and the appellation has been transmitted to their descendants. They are represented as gigantic in stature and barbarous in their manners. They were idolaters and polygamists; and their property was common possession. Ignorant of the use of iron, they cultivated the earth with the horns of bullocks, and sheared their sheep, and swathed themseves, with whitened flints instead of instruments of iron. Although they were denominated barbarous, they were singularly humane, and abhorred the idea of shedding blood. When any one of their princes died, they washed his body, and placing him erect in a cave, they put a sceptre in his hand, with two jars by his side, one filled with milk, the other with wine, as the necessary provision for his journey. When Cadamosto visited the Canaries in 1445, each island was divided into a number of provinces or districts, of which Teneriffe contained nine; but among these little states was overpassed the face of the country with carnage and blood; and yet their military weapons consisted merely of lances and two kinds of lances, one armed with horn, and the other wood hardened and pointed in the fire. For protection against the scorching sun in summer, and against the inclement cold in winter, they anointed their bodies with a mixture of tallow and the juice of certain plants, which tinged their skins with various colours, red, yellow, and green; and both men and women used this extraordinary defence and ornament. Each island and each state had its peculiar form both of religion and government; although within the same society every thing was common; viz. religion, customs, language, manners, and property itself. In Teneriffe there were no less than ten different sects of idola-
ters, some of whom worshipped the sun, and others the moon, and the rest of the heavenly bodies. Although polygamy was allowed, the virgins of the bride rightfully belonged to the chief; and the parties thought themselves highly honoured when he claimed his right. Upon the accession of a new prince, it was the custom to sacrifice a number of young persons of both sexes in honour of him, and in order to procure blessings upon his reign. This was done by precipitating themselves from a steep rock, after the performance of many absurd ceremonies, till they were dashed in pieces by the violence of the fall. The parents of these infatuated victims were distinguished by the favour of the reigning prince. The present Guanches are stout and robust, though inferior in size and strength to their ancestors. Their complexion is tawny, and their noses large and flat. Their genius is lively; they are brave, active, and cunning, and are much addicted to war. Their appetite is singularly voracious; and they live upon grain formed into cakes with milk and honey; and their food is preferred in skin-pouches, which they fasten to their belts and girdles, and in which they likewise bake them in the smoke. Some rigidly abstain from wine and also from animal food. Such are their avarice and activity, that they run up and down mountains, and spring, by means of long poles, from rock to rock with astonishing agility. In all their contests they use stones, and throw them with a force equal to that of a musket-ball. Dr. Sprat (Hist. of the Royal Society, p. 212, &c.) has related a variety of other curious anecdotes concerning this people. The race of the Guanches, however, is now almost extinct. The few who remain in Teneriffe are entitled to some very trifling stipend, as a price of the submition of their ancestors, from the court of Spain, which they punctually, and with some sensations of pride, annually demand. Many of the dead bodies of those Guanches have been found in perfect preservation, in an erect posture, placed against the sides of caves dug into the mountains; the bodies being wrapped round with several folds of goats' skins. The total net revenue of the crown, after defraying the expenses of administration, of all the Canary islands, amounts to about 63,000l. a year. See Teneriffe, &c. 

Canary, an island of the South Pacific Ocean. S. lat. 1° 51' 30'. E. long. from Paris 27° 35'.

Canary bird, in Ornithology, Canary finch. See Canaria Fringilla.

Canary, in Agriculture, a sort of plant cultivated in some of the more southern districts, as Kent, &c. for the small seed which it produces. It is observed, in the Agricultural Survey of that county, "that there are three kinds of tilths for it; namely, summer-fallow, bean-flavell, and clover-lay: the last the writer considers best. If the land is not very rich a coat of rotten dung is frequently spread for it." But whether manured or not, the tillage necessary is to plough the land the first opportunity that offers after wheat sowing is done; and so soon as it is tolerably dry in the spring, furrows should be made, about 11 or 12 inches apart, and the seed sown broad-call about four or five gallons per acre, and well harrowed in. When the blade appears, and the rows are distinct, the intervals are immediately hoed with a Dutch hoe, and afterwards, in May or June, the hoeing is repeated with a common hoe, carefully cutting up every weed, and thinning the plants in the furrows, if they are too thick. It is cut in the harvest, which is always later than any corn crop, with a hook provincially called a twill and a bite, by which it is laid in lumps or wads of about half a sheaf each. The seed clings remarkably to the hull, and in order to detach it the crop must be left a long time on the ground, the reception of moisture sufficient to destroy the texture of the envelope, otherwise it would be hardly possible to thresh out the feed. The wads are turned from time to time, to have the full benefit of the rains and sun, and thereby render them as dry as possible.

It is remarked, that the price of reaping canary in the isle of Thaneet was formerly from 6s to 11 shillings per acre, and the prices of threshing and dressing it five or six shillings the quarter; but at present they are considerably higher. According to the goodomes of the land, and the tillage that has been hallowed upon it, the farmers then expect their returns to be from 25 to 50 buffels per acre, but the common crop is from 30 to 34. It was formerly the practice to sow successive crops on the same land for eight or ten years, but this practice is now justly exploded. It is added, that sowing canary would be a very great improvement to lands which are convenient for water-carriage to London markets, as it is not a crop the farmer ought by no means to depend upon, not only because the return or quantity it yields varies greatly, but also on account of the fluctuation in the price of the feed in the markets. Some advise sowing this crop in drills a foot and a quarter, thinning the plants out afterwards, to 18 to 20 inches apart, and to leave them about two inches dipliant in the rows. Three gallons of feed in this way are sufficient for an acre, where a hopper is made use of to let by a spring as to deliver the feeds at equal distances. It should be sown about the end of February. The chaff of this feed affords a large proportion of good horse-food.

Canary-grass, a sort of grass which can seldom be cultivated with advantage as a meadow or pature grass: but one of the kinds of which is grown in some districts for the feed. See Canary.

Canary-grass, in Botany. See Phalaris Canariensis.

Canary-wheat. See Lichen Recumbens.

CANAS, in Ancient Geography, a town of Asia Minor in Lycia, which was formerly episcopal.

CANAS and Canches, or Tinta, in Geography, a jurisdiction of Peru in South America, in the diocese of Cusco, comminges about 15 or 20 leagues S. of Cusco, and extends about 20 leagues in every direction. The Cordillera divides it into two parts; the highest called Canas, and the lowest Canches. The latter, by reason of the temperature of its air, yields all kinds of grains and fruits; whilst the former affords pasture for very numerous flocks and herds; and in the meadows between the cervices are fed no less than 25 or 30 thousand mules, brought hither from Tucumia to pature. Here is a very great fair for these animals, to which dealers resort from all parts of the diocese. In the part called Canas is the famous silver mine denominated Conono.

CANASERAGA CREEK, a creek of North America, which runs north-westward into Genesive river at Williamsburg, in the late state of New York.

CANASIS, in Ancient Geography, a town of Asia, seated on the coasts of the Erythraean sea, in Carmania, according to the Periplus of Nearchus.

CANASTRON, a promontory of Macedonia, at the extremity of the peninsula of Pallene, between the Thermaic and Oranaic gulfs.

CANATAGUA, a mountainous ridge which passes N. and S. between the provinces of Veragua and Panama, in the Spanish territories of N. America.

CATH. See KENATH.

CATATTE COXONDE, a name given by the Ceylonese to a peculiar kind of cinnamon growing in that island: this is ekeene, the second kind in value, and the name they give it signifies bitter and alfringent cinnamon. The bark of this kind of cinnamon-tree comes off very easily, and is of a very fragrant smell when fresh, but it has a bitter taste. It is not very common in the island, and is not easily dif-
C A N
diligenous on the tree from the cold cinnamon. The trees which yield the eight different kinds of cinnamon, are very various in flavour and virtue, are all so like one another, that it requires a great deal of attention to distinguish them. The root of this kind of cinnamon tree yields a very fine sort of camphor. Phil. Trans. N° 409. See Cinnamon.

CANAVERUS DEMENTIUS, in Biology, a diligenous physician, and voluminous writer in medicine, born at Genoa, in 1559, received his education at Rome, where he became extremely popular as a physician, and acquired a considerable property. He died in 1635: The principal of his works are "De Legum Saevorum Commentaries," Rome 1604, in which he gives the distinguishing characters of the genuine wood; a furious kind having found its way into the shops, and been used in its stead, "Ars Medica." Geno. vol. 1604. This is a reproduction of his account of all the diseases incident to the human frame, with the mode of treating them, taken from the most approved writers, originally printed in 1520 at Venice, here much enlarged and improved. Haller, Bib. Med. Elns. Diet. Hilt.

CANAVEZ, in Geography, a district of Italy, in the principality of Piedmont, of which Ivene is the capital.

CANAVEZ, a town of Portugal, in the province of Entre Duero e Minho; 27 miles E. of Porto.

CANAWISQUE, a western branch of the river Tioga, in America, which rises in Pennsylvania.

CANCALE, a sea-port town of France, in the department of the Ille et Vilaine, and chief place of a canton, in the district of St. Malo; celebrated for oysters: 3 leagues E. of St. Malo. N. lat. 43° 41'. W. long. 9° 31'.

CANCANI, or Cancani, promontory of the, in Ancient Geography, is placed by Ptolemy in the isle of Albion, and is thought to be Brachypit point in Caernarvonshire.

CANCARELLA ASPARAGI of Vailin, in Entomology, synonymous with cryptopodius campefris of Fabricius.

CANCELLER, in Falconry, is a light-flown hawk, in her flocking, turns two or three times upon the wing, to recover herself before the feizes.

CANCELLARIUS, in Antiquity. See Chancellor.

CANCELLATA, in Conchology, a species of Arca, the shell of which is marked with cancellated lines, and bearded; the margin gaping in the middle. Schloet. Inhabits the American ocean.

Obs. In its natural flate this kind is covered with a moist epidermis, or membranaceous coating, beneath which the shell is of a somewhat fusaceous colour, mixed with white, and becket on both sides with four tufts of hair; beaks slightly recurved; posterior depression lanceolate.

CANCELLATA, a species of Nerita, the shell of which is marked with decussating lines and impressed dots; spine lightly elevated; umbilicus gibbous and bifid. This inhabits the coasts of the American islands. Chemnitz.

Obs. This shell is white, and obfoletly spotted, and is sometimes marked with rays or a fulvous band.

CANCELLATA, in Conchology, a species of Cicada, found in Denmark. The colour is yellow, with three dots on the feutal, and tip fusaceous; wings white and reticulated. Mull. Zool. Dan.

CANCELLATA, in Ornithology, a species of Torda, seven inches and an half in length, that inhabits Nativity Island, Luitham calls it the barred phalarope. The upper feathers are brown edged with white; lower ones white with transverse dusky lines; feet pinnaed and dusky.

CANCELLATE, in Botany, open like lattice-work. A term applied to the involucre in atraclis cancellata, to the capsule of the lily, &c.

CANCELLATUM, in Conchology, a species of Bucinum, of a small size, mentioned by Seba. The shell is glabrous, with breaks and lines that variously decussate each other. Native place unknown.

CANCELLUM, a species of Cardium, of small size. This kind is reddish, thin, roundish, with decussating lines. Gaet. &c.

CANCELLI, in Building, lattices, or a sort of windows made with crofs bars of wood or iron, checker-wise.

The term is also applied to the small bars or raft which compass a cut of pulley, a common sort of, or the like.

CANCELLUS, in the Civil Law, an act whereby some former deed is revoked null and void.—This is otherwise called reficlion. The word comes from the Latin cancellum, to encompass, or pile a thing. In the proper sense of the word, to cancel, is to disannul an obligation, by parting the pen from to top to bottom, or across it; which makes a kind of checker lattice, called by the Latin cancellus.

CANCELLING of deeds, letters patent, and wills. See these articles.

CANCELLUS, in Entomology, a Fabrician species of Gammarus (Cancer, Linn.) found in the rivers of Siberia. It is specifically distinguished by having four hand-claws which are deltitude of fangs, and sixteen feet. Pallus describes the same insect under the name of cancellus, but as an oceanus. This crab is of a small size, being very little larger than gammarus lucifus, and has the first pair of antennae incarnated.

CANCELLUS araucanus, Petiver's name of Phalangium reinornae, Linn.

CANCER, the Crab, in Astronomy, one of the twelve signs of the zodiac, and one of the 43 old constellations; ordinarily represented on the globe in form of a crab, and in astronomical books denoted by a figure much resembling that of the number sixty-nine; thus &c. The reason generally assigned for its name, as well as figure, is a supposed resemblance which the sun's motion in this sign bears to that of the crab-fish. As the latter walks backwards, so the former in this part of his course begins to go backwards, or recede from us; though the disposition of stars in this sign is by others supposed to have given the first hint to the representation of a crab. The Greeks pretend that when Hercules was contending with the Libyan hydra, a crab which crawled upon the marsh feized his foot. The hero, however, crushed the reptile to pieces under his heel; but Juno, in gratitude for the offered service, though inconsiderable, advanced the creature to the heavens. The stars in the sign Cancer, Ptolemy makes 13; Tycho 15; Bayer and Hevelius 29; Mr. Flamstead no less than 83. For an estimate of the comparative brightness of several stars in the constellation Cancer by Dr. Heffelch, see Phil. Trans. vol. lxxxvii. p. 311, &c.

CANCER, tropic of, a lesser circle of the sphere parallel to the equator; and passing through the beginning of the sign Cancer. See Tropic.

CANCER, in the Military Art. See Aries.

CANCER, in Surgery, is a disease respecting which the most enlightened and experienced practitioners, for more than two thousand years, have confessed their extreme ignorance; while some of the illiterate and unskilful part of mankind have never ceased to boast of their specific remedies, and still continue to impose on the unfortunate victims of this destrutive malady.

It cannot be at all doubted that numerous cases on record, denominated cancer, and perhaps all those in which cures of this disease are said to have been performed without destroying or removing the part affected, were complaints of a very different nature, and sometimes of an entirely opposite character. A large proportion of the remedies employed by
The ambiguous and undecided state of our knowledge in the diagnostic signs of cancer, has been a most fertile source of error and deception; and, while we remain unfurnished with authentic standards, or established data, by which all observations may be examined, it ought not to excite surprise, if the same name be applied to two complaints, the histories of which are repugnant to each other; or, if opposite modes of treatment be directed for diseases that bear a common appellation. See Mr. Peardon’s “Observations on Cancer,” p. v.

A great deal of commendable pains has been lately taken, by the promoters of two public institutions in London, to investigate the nature and treatment of carcinomatous disorders; but, from the first results of their labours, we scarcely can say that any approaches have yet been made towards the attainment of so desirable an object. One of these gentlemen has shown, with much clearness and acumen, that our best definitions of fibrous and cancer have been very inaccurate and erroneous; whereas another surgeon, of considerable reputation and experience, affirms that “there can be no difference of opinion respecting the nature of the complaint;” and, says he, “the truly fibrous tumour, which is known to be capable of forming the cancerous poison, when allowed to increase in size, has been so often debased, that every surgeon must be enabled from those accounts to pronounce the tumour, when he meets with it, to be of that kind. See Mr. Home’s Observations on Cancer, 8vo. Lond. 1805, p. 156. This author likewise thinks he has proved decidedly, that cancer is not a dis ease which immediately takes place in a healthy part of the body, but one for the production of which it is necessary the part should have undergone some previous change, connected with disease;” whereas Mr. Peardon has adopted the contrary opinion, viz. “that a cancer is always an original disease, and never appears as the sequel of any morbid affection whatever.”

The truth is, we are still in the dark concerning the proximate cause of fibrous and cancer, or the nature of that peculiarity of constitution in different persons and sexes, which predisposes them to this malignant derangement of animal structure. We do not even know precisely in what the cancerous state of an organ consists; and it is yet debated in the medical world, whether or no the disease be local; —although, in our own judgment, the affirmative proposition is always true in the early stages of a cancer.

If we may credit the accounts published by various authors, it appears that there is scarcely any part of the body which is wholly exempted from the attacks of a cancerous affection: but it has been ascertained by reiterated observation, that glandular parts are much more liable to this disease than any other; and it is to a gland only that we are accustomed to apply the term fibrous, which denotes a morbid condition invariably tending to the state of a perfect or genuine cancer.

The name of fibrous has too vaguely and unguardedly been applied to indurated tumours of the non-secretory or absorbent glands, and hence has arisen the epithet of “venereal or fibrous fibrous;” so that patients labouring under such indurations have often been alarmed without any necessity. Indeed, Mr. Peardon says, he “never met with an unequivocal proof of a primary fibrous in an abor

by empirics and purrs for the cure of cancer includes those means which, after long and mature trial, have been rejected as inefficacious by regular surgeons; and, it is well known, that the more innocent (because less active) ointments, and other compositions, now publicly advertised by cancer-curers, are such as no person could have proposed who had the slightest acquaintance with the real forms of this disease.

A true fibrous, before it degenerates into a cancerous form, is hard and unequal on its surface, slightly tactile to the touch, not tending to suppuration, and enlarges very slowly in its commencement; but at length, assuming a more active form, it is surrounded with superficial varicose veins, when it becomes rather painful, and changes the texture of the adjacent cellular membrane or cuticular covering, to which it frequently adheres: the skin, will, in this advanced period, sometimes be discoloured, and puckered or retracted, especially in the female breast; perhaps attended with a degree of softness or fluctuation in some part of the tumour, with shooting pains in its neighbourhood; and at last breaking into a malignant sore, with fungous flesh, and retroverted edges, where it is named an open cancer.

Eroding, forbid, and rebellious ulcers will arise spontaneously in various parts of the body, without being preceded by a fibrous tumour; and, as many of those resemble the cancerated fore, in their general appearance and fatal termination, they have been indiscriminately ranked among cancers, for want of a better classification. See the articles Ulcer, Leprosy, and Elephantiasis.

The fibrous tumour, above described, which has a constant tendency to degenerate into a confirmed cancer, (though not always equally rapid in its progress) will seldom or never yield to diuretic applications; and should therefore be extirpated without delay, if the circumstances of the patient do not otherwise prohibit this operation. The fibrous, on its removal, will exhibit a somewhat different appearance in its structure, according to the progress it has previously made towards maturity. In its early stage, the centre is more dense and semi-cartilaginous than the circumference, the whole being intersected by irregular bands of a ligamentous texture, blended with glandular substance; but as it advances, this central part is less observable, although the intersecting filaments still exist, and an irregular spongy cavity is formed within the tumour, filled with a bloody fluid. Sometimes the mass is composed of several distinct portions, enveloped by the ligamentous bands disposed in concentric circles; and in other cases, there are cysts of various magnitude, in different parts of the tumour, which Dr. Adams believes to be real hidatois, poissified of vitality.

Means have been adopted by several practitioners at different times, to analyze fibrous or cancerous masses; but without affording, hitherto, any satisfactory results. Indeed, the tests to which they have submitted these morbid substances must have entirely decomposed them and altered their nature; so that, probably, we shall not obtain much useful information by having recourse to chemical agents for this purpose.

The chief defiderate in surgical practice, is to discriminate between serofulose indurations and fibrous tumours in the living body; for it is a question, on which the well being of patients must often depend, to determine the precise nature of a disease, before we proceed to active measures. Notwithstanding the apparent confidence with which Mr. Home, in a passage we have quoted, ventures to pronounce respecting the facility of distinguishing and ascertaining a fibrous affection, he, in another part of this book (p. 167.) acknowledges himself to have frequently been mistaken in his diagnosis; and these are his words:

"So much does the same disease differ in its appearances, in different patients, from the endles peculiarities of their constitution, by which every part of their body must be more
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more or less influenced, that it is not possible in practice to distinguish, in all cases, between cancerous and tuberculous tumours, after they have advanced to a certain size; and I am ready to confess that, in many instances, I have mistaken the one for the other, and have removed, by operation, tumours which, at the time, had the appearance of being cancerous; and upon examination, after their removal, found them of a tuberculous nature. On the other hand, I have neglected to remove tumours from the circumstances making it probable that they were tuberculous; which afterwards became cancerous, and destroyed the patient.

In all such doubtful cases, it is the safest rule to advise the removal of the tumour, if it be situated fairly for the operation; as it is a much less serious inconvenience to get rid of a diseased tuberculous gland, than to retain a cancerous tumour, which probably might cohabit the patient's life, in the event of its contaminating the adjacent parts by its malignity. There is reason to suspect that many surgeons, who boast of their extraordinary successes in extirpating cancers, have sometimes dissected out tumours which might very innocently have remained: for the surprising durability we find, in the results of the practice of different surgeons, is not capable of being reconciled by any other supposition.

Thus Mr. Nooth affirms "that in 102 firchonous cases, in the early stage of the disease, where he performed the operation, all remained free from any return of the complaint," whereas Dr. Monro's says, "of sixty cancers, which he had extirpated only four remained free of the disease for two years," and these became cancerated afterwards!

This report of the late Dr. Alexander Monro (in Edin. Med. Edi. Vol. 5.) is so very discouraging, that it will not be improper to suppute the failures in those cases arose from some peculiarly untoward circumstances; and yet we have another account, by Mr. J. Hill, of "of less than 88 genuine cancers, all ulcerated except four," being extirpated by himself, and "all the patients but two recovered of the operation." Mr. Hill says, "of the first 45 cases, only one proved unsuccessful; in three more the cancer broke out in different places: and a fifth was threatened with some tumours at a distance from the original cancer: these tumours did not appear until three years after the operation; but the woman was carried off by a fever before they had made any progress. All the rest of the 45 continued found so long as they lived, or are so to this day; one of them survived the operation above 30 years; and 15 are still alive, though the last of them was cured in March 1761.

"Of the next 33, one lived only four months; and, in five more, the cancers broke out after having been once healed.

"The reason why, out of 45 cases, only four or five proved unsuccessful, and fix out of 33, was owing to the following circumstances: the extraordinary successes I met with made cancerous patients flock to me from all corners of the country, several of whom, after delaying till there was little probability of a cure by extirpation or any other means, forced me to perform the operation, contrary both to my judgment and inclination.

"Upon a survey in April 1764, the numbers stood thus:

<table>
<thead>
<tr>
<th>Total cured</th>
<th>63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of whom, when cured, were aged</td>
<td></td>
</tr>
<tr>
<td>between 70 and 80</td>
<td>15</td>
</tr>
<tr>
<td>70 and 70, 17</td>
<td></td>
</tr>
<tr>
<td>50 and 60, 18</td>
<td></td>
</tr>
<tr>
<td>Below 50, or ages unknown</td>
<td>13</td>
</tr>
</tbody>
</table>

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"Of the above 63, there were alive in April 1761, 62 and 70. 17 70 and 70, 17 70 and 70, 17 |
| In all | 39 |

"In 28 of the above number, the operation had been performed more than two years before.

"In 11, the operation had been done in the course of the two last years.

"So that, upon the whole, after a course of 50 years practice, 39 of 63 patients were alive and found.

"From the above survey, it appears, that the different patients lived as long after the extirpation of the cancers as, according to the bills of mortality, they would have done, had they never had any cancers, or undergone any operation.

"The remaining 25, which compass the 88, were cured since the year 1764, 82 of whom have been at least two years cured: one or two of these patients were 70 years of age, one 90.

"Mrs. Mundal was 90 when she got a cancer cut off her cheek, 28th June 1768; another appeared upon her forehead in 1770, and was extirpated on the 5th of April that year. After both which recovered; but a tumour appeared below the maxillas, which carried her off in November 1771, above three years after the first excision; that is, when she was 93 years old.

"The tumour therefore at present, July 1779, stands thus:

<table>
<thead>
<tr>
<th>Of 88 cancers extirpated, at least two years ago,</th>
<th>Not cured</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Broke out afresh</td>
<td>9</td>
</tr>
<tr>
<td>Threatened with a relapse</td>
<td>1</td>
</tr>
</tbody>
</table>

"Which is less than a seventh part of the whole number.

"At this time there are about 50 patients alive and found, whose cancers had been extirpated above two years ago.

"Of five cancerous breasts, only one was ulcerated, which, with one of the occult kind, did not heal; a third relapsed, probably owing to the whole not being fully cut away; the other two are still firm and found in 1772, though one of them was cut October 24th 1764, and the other April 26th 1766." See Mr. Hill's Cares in Surgery, 12mo. Edin. 1772.

This author's experience, we perceive, was by no means so discouraging as that of Dr. Monro, nor was it so completely unavailing as that of Mr. Nooth: but it should be remarked, that Mr. Hill's cases were much worse, and more advanced than those of Mr. Nooth, while the circumstances are not known which occasioned the ill success alluded to by Dr. Monro. Upon the whole then, we think the numerous patients who are afflicted with external cancers need not sit down in despair; as if it were useless to undergo the operation, when performed in due time, and by a skilful surgeon. The refult of our own practice has not been so favourable as that of Mr. Nooth, but has proved at least as successful as Mr. Hill's; and we have no reason to doubt that our contemporaries have been equally happy in their experience after the operation.

To avoid the difficles and pain attendant on such a surgical operation as that of cutting out the part affected, a great variety of means, both external and internal, have been proposed for the cure of cancer; these may be ranked under the several heads of 1. Difficulties.-2. Corrosives.—Mr. M

J. Nar-
CANCER.

3. Narcotics. We could substitute a long list of those remedies from the vegetable, animal, and mineral kingdoms; but since no surgeon of reputation will trust to any of them, after the varied trials which have been so often made, both in this country and upon the continent, we shall not extend the present article by reciting their names and supposed qualities. A few words may, however, be added respecting the most eligible means of palliating symptoms either before the cancer is confirmed, or when it has gone on to a state of ulceration, and cannot be extirpated.

Many hard swellings in the breast, especially those of a pectoral kind, and such as appear after child-beariing, have been mistaken for cancerous tumours; but they may generally be dispelled by the early and repeated application of leeches, bathing with camphorated spirits, soap liniment, hemlock poultices, furminon lotions, or gentle rubbing with mercurial ointment. It has been justly observed by Mr. Home, "that the successes met with in some of these cafes is often productive of material mischief, by inducing the practitioner to be too lenient, and to go on with the use of the same means in other cases, encouraged by his former successes, till the disease has arrived at the state of a true cancer; and therefore has advanced beyond that stage in which it might have been removed by the operation of extirpating the tumour."

It is of great importance, on the one hand, not to alarm our patients prematurely, by giving too hastily and unfavourable an opinion; but, on the other hand, practitioners would do well to weigh all the circumstances which may enable them to decide on the nature of such tumours, and if they are confident of their being carcinomatus, to lose no time in advising the only leap which can be taken for the security of the unfortunate sufferer.

The following are Mr. Hill's rules of determining whether an external swelling be of a cancerous nature or not; viz.

1. When firous tumours are considerably advanced, they are surrounded with large varicose veins, resembling crab's claws, from which resemblance they have got the name of cancers. The absence of these, therefore, is a favourable circumstance, but not to be absolutely depended on.

2. The skin of a cancer, when near bursting, is of a reddish blue, or a blue livid colour, adheres to the under part of the indurated gland, (from which it was originally detached,) and is puckered up into ugly folds, as if leached.

3. On the other hand, the cutis, or skin, when inflamed, is always accompanied with a fever, which keeps parallel with the degree of inflammation. But a cancer is never attended with a high inflammatory fever. It is true, the excessive pain of a cancer sometimes quickens the pulse, but at the same time sinks it.

4. The skin of the inflamed cutis, or phlegmon, instead of being wrinkled or plaic'd, is smooth, red, and stretched, so as sometimes to have a glazed appearance; and, when near bursting, the matter is always found fluctuating below, which seldom happens in cancers. On the contrary, cancers are generally accompanied with a corrodious humour, which abrades the cuticle, till the outer parts are consumed; but no matter is perceived within; whereas, in the cutis, &c. the scar-fim is the last part that gives way, unless it be scal'd or fretted by too hot poultices.

5. The cold scrophulous tumor is in full less danger of being mistaken than the inflammatory kind. For the pain and hardness are not so conspicuous as in the inflammatory tumor; and the matter accumulates for a long time before it bursts. In either kind, if good pus appear, there is no occasion for being afraid of a cancer; and, although the pus should not be of the most laudable kind, but of a whitish fuminous aspect, yet it is never so acid as that which proceeds from a cancer. Nay, even a red, bloody, or fuminous matter, is not of itself a characteristic symptom of a cancer. Excepting the case mentioned above, I have never seen any cancer that contained matter; but I have seen numbers of other ulcers, in bad habits of body, full of bloody ichor."

The hooing cancer-curers of our time have not sufficient knowledge to discriminate between the different kinds of tumours they meet with, and perhaps too little honestly to confess that the cafes in which they have ultimately had some successes were really not cancerous; for such an acknowledgement would annihilate their traffic, and destroy their ill gotten reputation. But our own opportunities have enabled us to affirm, that this mercenary class of practitioners habitually by imposing on the credulous and inexperienced part of mankind, especially the weaker sex, who are tormented by curable disorders, falsely named cancers.

Supposing it to be ascertained that a cancer exists, and it has proceeded to a state of ulceration, not admitting of a surgical operation, the patient should avoid using any means of relief which irritate and give pain; unless it be proposed to destroy the whole by a cautery, which indeed is a far more tedious, uncertain, and tormenting plan of treatment than by cutting out the part.

The topical applications to an open cancer, which have been found most useful to alleviate pain, cleanse the sore, or to correct the fist smell arising from it, are as follow:—
1. Fresh bruised hemlock-leaves.—2. Scraped young carrots.—3. The fermenting poultice.—4. Finely levigated chalk.—5. Powdered charcoal.—6. Carbovnic acid gas.—7. A watery solution of opium.—8. Liquid tar, or tar-water. The internal remedies which have been most beneficial are, 1. Very small and long continued doses of arsenie.—2. Liberal doses of eicuts.—3. The free use of opium.—4. Belladonna.—5. Solarum.—6. Martial flowers.—7. Corroborative sublimates.—8. The juice of civers or goose-grass. But neither the external nor internal remedies, however apparently useful for a time, can be in the least depended on for the cure of a genuine confirmed cancer.

The removal of firous tumours and cancerous excrescences may be effected in various external parts of the body; but no surgeon perhaps could now be found to undertake the excision of any internal organ, for example the uterus. Attempts have been often made by ignorant and bold empirics to destroy a cancerous ulcer of the womb by corrosive injections; but the practice is as cruel as it is absurd, and we have seen the most dreadful consequences from such attempts, without affording the smallest relief to the unhappy patient. Several examples are recorded of the uterus having been excised, and some of these women have survived; but no one that we know of, is related of such an operation being performed for the purpose of extirpating a cancer, although we are aware that it has been lately proposed by a speculatrix writer of Germany. See Med. and Phyf. Journ. vol. xi. p. 34.

The circumstances which indicate the propriety of an operation are these:—1. When the cancer is so situated as not to expanse any large blood-vessels or nerves to be cut during the operation.—2. When the whole of the morbid parts can certainly be removed.—3. When the disease has arisen from some accident, and not spontaneously.—4. When the patient is otherwise healthy.—5. When the cancer has not shewn evident symptoms of considerable malignity during its progress, and does not seem to have involved the adjacent glands or absorbent vessels. The two first of these requisites are not to be dispensed with; for unless we can di-
feet out all the morbid parts, without incurring the danger of dividing important nerves or arteries, this operation must never be attempted.

The mode of operating will vary in different cafes and situations. Some excellent directions are given on this subject by Meffrs. Feeon, Home, Pearon, Bernalen, Rich-ter, Le Duan, Sabatier, and Callifon; which young surgeons should consult, in particular emergencies: the only general rules we can here lay down are,

1. To make the external wound neatly in the direction of the subjacent muscular fibres, and to make it large enough for the removal of all the morbid parts.

2. To sally all the skin which is not diseased, unless there might be too much to heal up nearly.

3. To secure every bleeding vessel, by a ligature, which might hazard a subsequent hemorrhage.

4. To maintain the lips of the wound in close contact, without interposing any dressing or extraneous substance between them.

5. To preserve the parts in an easy and ready position for some days, before they are looked at or opened.

6. To use no other than mild and cooling applications during the cure.

The only point of importance on which we have as yet offered no observations, but which will nevertheless be deemed highly deserving of general attention, is the comparative advantages and disadvantages attending the modes usually employed for the extirpation of cancers.

This is a subject, respecting which, unprofessional readers, especially those who suffer from the complaint, may naturally desire to make up their minds; and, on that account, we shall not hesitate to lay before them the judicious remarks of a late author, who has treated this question very amply. See Home's Observ. pp. 178—189.

"There are two modes by which a cancer may be extirpated; one, is taking out all the parts that are diseased, by a cutting instrument; the other, making use of such applications as will render them dead, and thereby occasion their being thrown off.

The advantages attending the operation by the knife are such as to give it a decided preference in all cancersous diseases. It is the only mode which is capable, in the more advanced state of the disease, of removing the contaminated parts to a great extent; and, in doing it, the surgeon is enabled to take away with precision every part he thinks liable to have been affected. When the operation is over, he can examine the diseased part that has been extirpated, and see whether it is every where surrounded by healthy parts; and, if it is not, by referring it to its natural situation can remove any part which may give him the least cause to suppose that it is contaminated. The skin, after such an operation, is in a loose state, and admits of its edges being brought together, so that the wound may always be much diminished in size; and, in very many instances, the cut edges may be brought together like those of a simple incision.

The operation is only of a few minutes continuance, and the moment it is over, the parts are in a state to commence the process which is necessary for their recovery; and in the course of two or three weeks they are entirely healed, even where the diseased has not been completely removed.

The modes of deadening the diseased part, which have at different times been employed, are three; and as these have sometimes been preferred to the operation by the knife, and some of them are still in use, it becomes necessary to explain in what way they acquired their reputation, and to shew the disadvantages which attend their operation.

"In the earlier times, when the knowledge of cancer was more imperfect than it is at present, an idea was entertained of its growth being similar to that of a vegetable; and it was therefore thought that unless it was taken out by the roots, the diseased was not completely removed. It was then found that very active cauteries were capable of deadening the whole tumour, which is always more or less of an irregular form; and when the diseased part was thus brought away, the projecting portions were considered as the roots of the cancer; and the proving of it being completely eradicated was, that the fore readily admitted of being healed.

Any recurrence of the disease from the contaminated parts, which had not been destroyed, was supposed to arise from the contamination being in a diseased state, and not from any failure of the action of the cauteries; and in this way the original idea of its being a constitutional disease was most probably formed.

"The fact is, that diseased parts have less powers of supporting themselves than healthy ones, and therefore are more readily destroyed: so that a powerful cauterity acts twice the extent, in a diseased part, to what it does in a natural one; and an indolent tumour can have every part of it deadened by means that would only produce a violent inflammation upon the common skin. It was therefore by no means an unfair conclusion, till it was contradicted by experience, that such applications as were capable of deadening every part that was in a diseased state without acting upon the healthy surrounding parts, were to be preferred to the operation by the knife; and it is within my own remembrance, that such an opinion was general in London. Since that time, two things have been ascertained, which prove, that when the tumour has become cancerous, such cauteries are incapable of removing the diseased entirely; the one, that when the poison is once formed, the contamination precedes and extends beyond the diseased alteration of structure; the other, that every thing which irritates the diseased part increases its action, and its power of contamination: and in fact, all regular practitioners have laid aside the arseneal applications to cancerous tumours in the breast, in consequence of finding that the diseased was rarely removed by them.

"They still retain a certain degree of reputation, and are used by several empiemists in London; and cures performed in this way are well authenticated; that is, they succeed when applied to tumours which are yet in a indolent state, if they be diffusely powerful to destroy the whole tumour; and as there is no possibility of ascertaining what the structure of the tumour was, which has been thus destroyed, it is flated by the practitioner to have been an invertebrate cancer, which is attempted to be proved by showing its roots, or the irregularities upon its external surface. But the cauteries, when too weak for the destruction of the diseased part, irritates, and makes it sooner become cancerous. When applied to a cancerous tumour, although strong enough to deaden the whole, it irritates the surrounding parts that have been previously contaminated, and makes them sooner assume the characters of the diseased. This not only happens when cauterities applications are used, but when mortification takes place from any other cause, as in the case flated in a former part of this work.

"This fact of the contaminating power of morbid poisons being increased by any thing that irritates the diseased parts, is not peculiar to cancer. It happens also in the veneral diseased, of which too many instances have come under my own observation.

"I have been, for some years, a favourite practice to attempt the cure of cancers by touching them with cauteries, whilst yet of a small size, and repeating the application till
CANCER.

a found surface is exposed, after the throat has been thrown off, and then to allow it to heal. The effect of this practice is exactly similar to what has been stated. The chancre is cured, but the poison is absorbed, and the constitution contaminated by the disease. But if the chancre be so small, when the caustic is first applied, that the whole ulcer and some of the surrounding parts are deadened completely by one application, the patient will then be perfectly cured of the disease; as there was not time for absorption before the application was made, and its effects were such as to preclude its taking place afterwards. If, on the contrary, the first application only destroys a part of the disease, it irritates the absorbents, and gives them a disposition to take up the poison at an earlier stage than usual. From an experience of this being the case, I have for many years entirely left off the practice of using such modes of treatment, in the early stages of chancres.

"The caustic applications which have been employed for the destruction of cancerous tumours are the following: arsenic, corrosive sublimate, and the actual cautery. As these means are also used for the purpose of removing other tumours, whose structure prevents the knife from being employed, I have had frequent opportunities of making observations on their comparative effects. Indeed the statement contained in the second case which has been mentioned in this volume, explains their different effects upon the same person, so as to afford us the most satisfactory information respecting them.

"The only preparation of arsenic which I have used, is equal parts of the white arsenic and sulphur; these proportions were first recommended to me by Mr. Cline. This acts as a powerful caustic, and appears capable of destroying any tumour which has not acquired the disposition to throw out a fungus. The thongs formed by each application will be very much in proportion to the quantity of the powder applied. By this means I have removed a large tumour in the cheek, which appeared to be taking on the previous flake to becoming a cancer. I have also destroyed a large tumour in the foot. In the last case it certainly affected the constitution, in a manner very similar to what has been already described. In the other, no such effect was produced; so that it would appear that the arsenic is in some cases absorbed more readily than in others.

"The local effect of arsenic is that ofproducing fo violent a degree of inflammation in the part to which it is applied, that mortification ensues. When applied to the flomach, indeed, it destroys the patient before mortification absolutely takes place; and the apparent effects of inflammation upon the part, are not such as would destroy life, were they produced by any other cause. It is to be presumed therefore that the arsenic, taken internally, kills by being absorbed, and producing effects in the circulation incompatible with life. Several instances of patients dying from the effects of arsenic upon the internal coat of the flomach have come under my observation, and specimens of its local effects are preserved among the morbid preparations in the Hunterian Museum.

"Corrosive sublimate acts both locally and constitutionally, as well as arsenic. Its local effects are however less powerful, destroying parts to a less extent, and the constitutional effects from absorption are more like those common to the different preparations of mercury than to those of arsenic.

"The actual cautery is at present almost entirely diffused in surgery, except in cases of dis eased bones, where it is employed to produce death in the part affected, and in that way, put an end to the disease. It is a much milder application than either of the above, gives less pain while acting locally, and produces no constitutional disturbance; and where it is necessary to keep at bay a fungous excrecence, whose growth is not very luxuriant, I should prefer it to the others, from a belief that it does not in the same degree hurry on the diseased action of the tumour. In cases of fungous tumours in the mouth, it is the only means that can be employed; and in an instance of that kind, the diseased was kept under for seven or eight months, by its occasional use, without much pain being produced, or the disease being at all advanced in consequence of the application.

"This account of the effects of caustic applications is given in this place; to show in what they differ from the operation by the knife; and when compared with it, what are the disadvantages, in cases of cancer; although in other tumours, of a less malignant nature, they may be employed with success."

Deferenda relating to Cancer and Syphilis.

The following inquiries were suggested by the perusal of a paper which was printed and distributed in the year 1803, by the medical committee of an institution set on foot for the relief of persons afflicted with cancer. The writer of this article, however, has not thought it necessary to confine himself exactly to the plan which is prescribed in that paper; but has considerably increased the number of queries, with a view to throw readers in general how many difficulties exist on a subject which certain impostors and credulous persons affect to thoroughly understand.

"Query 1. Is there any peculiar habit of body, or mode of living, in either sex, which disposes persons to the formation of cancer, or which enables them to resist its influence?"

2. Is it well known that at certain periods of life, especially in females, this disease is frequent in its appearance: on what physical causes does that liability depend?

3. Are there any means by which the actual formation of a cancer might be prevented, in families where this disease has seemed to be hereditary?

4. Do persons ever suffer in their childhood, or before the time of puberty, from spontaneous attacks of cancer?

5. Does a child become cancerous by sucking a cancerous woman; or could this disease be produced by transferring the virus from one subject to another, in a way of accidental inoculation?

6. Are there any parts of the body exempted from ever assuming this disease; and why do certain organs more frequently become affected than others?

7. Is it clear that the disease called cancer in some brute creatures exactly resembles this complaint in human beings?

8. Has climate or local situation any influence in rendering the human constitution more or less susceptible of cancer?

9. Do the cancers which arise in consequence of particular employments (as chimney-sweeping) at all differ in their nature from those which affect persons under different circumstances?

10. How many kinds or diversities of cancer are there; and do they all, in their several stages, properly come under the same generic appellation?

11. Is there any well marked affinity or relation between cancer and other diseases, in their origin, progress, termination, or difficulty of cure?

12. What are the specific differences between febrirux, carcinomas, lupus, noli me tangere, fungus hematodes, elephantaia, and syphilis?

13. Does the existence of a cancer in any one part of the body afford a presumption that there is a cancerous diathesis, or tendency to a similar morbid alteration of other parts, in the same subject?

14. May
14. May cancer be regarded at any period of its duration, or under any circumstances, merely as a local disorder; i.e. limited to the spot which is visibly affected, and not necessarily contaminating (although tending to contaminate) other organs?

15. Has it been incontrovertibly decided, whether external injuries give rise to cancer in any other way than by resorting to action a disease virtually existing, or at least which was predispited to make its appearance?

16. Does this inherent disposition of dormant cancerous tendency imply a morbid change capable of detection, and of being rendered quiescent by artificial preventive measures?

17. In what sense may it be admitted that cancer, or the carcinomatous distemper, is ever hereditary? And are there any well authenticated facts to support this notion, in any other sense than as children may inherit the same organization or bodily structure which their parents possessed?

18. Is it certainly known and proved that one particular constitution or temperament of body predisposes to this disease?

19. Is the cancerous matter of a volatile and infecting nature, so as to generate this disease in a healthy person, (without real contact) by effusion in the atmosphere exhaled from a cancerous sore; or does it only contaminate by direct absorption of the virus?

20. Can the essential form of any other disease be so changed as to assume a carcinomatous flatte, and finally to degenerate into a cancer?

21. Are there any phlegmatic signs, either local or general, by which we can foretell that more obvious morbid change named cancer; or does there necessarily occur any visible alteration of structure in a part, prior to its being absolutely affected by this disorder?

22. Has a genuine and confirmed cancer been cured by art, without extirpating or destroying the morbid mass?

23. What is the forensic and medical method of eradimating cancers of every description?

CANCER is a Surgical term also applied to a species of hagfish for the head, and divided into several parts, resembling the legs of a crab-fish.

Cancer, in Zoolosy, one of the genera of aquatic infects in the Linnean system. It is also a subdivision or family of the Linnean Cancer moulded into a distinct genus in the Fabrician Entomologia Systematica, and other works of that writer, and a genus of crustaceous animals distinct from infects with Cuvier, La Mare, Latreille, Bosc, and others.

Under the generic title of cancer, Linnaeus compiles all the species of crabs, lobsters, shrimps, hermit or paratitic crabs, and in a word every animal of the true crustaceous kind that appears to have been known to him, with the exception only of the two genera Monoculus and Orlocus, both which are separated by him from cancer.

Linnaeus was induced to consider the cancer, and the two last-mentioned tribes of crustacea, as infects, principally from the circumstance of their being furnished with antennae, pitting articulated limbs or legs, and having the body covered with a solid cud. Being delitute of wings these are referred to the last order of infects Apera, where they follow the genus Scorpio, and precede the two analogous tribes Monoculus and Orlocus. That Linnaeus was not strictly correct in placing the cancer with infects, even according to his own definition of the infect tribe, is evident, but the objections so far as they regarded exterior characters were of little consequence, and after his system had become generally known the cancer were admitted without further inquiry as genuine infects into every entomological cabinet. The French naturalists of the present day do not, however, consider them as infects, but independent of these there are indeed few who, either from accustomled habit, or opinion, founded on the Linnean method, do not regard them as a branch of extermites.

From the earliest times in which mankind appear to have discriminated with tolerable precision the affinity which natural objects bear to each other, and their relative position in the chain of nature, crabs and lobsters were supposed to belong to the invertebrus tribes of animals, and not to infects. But they were incontinent to those minute characters which in the present state of science we are compelled to have recourse to; those animals were tolerably of the same order, and in their ideas made of course parable of the structure of fishes. The Greeks and Romans entertained this notion; they admitted them as a race of creatures strongly allied to fishes, and from being covered with a shell as forming an intermediate link between fishes and the covered or tettaceous mollusca, or what is commonly understood even at this time amongst us by the name of shell fish. In this light only they were viewed by succeeding generations even till the time of Linnaeus, who in his great reform of the animal kingdom thought it necessary to separate them entirely from the covered mollusca, and place them amongst infects.

How far Linnaeus was right in rejecting the established though vulgar notions that had prevailed among mankind for so many ages, remains to be examined. To a curious observer it must appear strange, we had almost said unphilosophical, to be told by those to whom they look up for scientific information, that crabs and lobsters belong to the same class of animated beings as beetles, moths, and butterflies. But we are not to be governed by prejudices, nor by the veneration we are too apt to entertain for the knowledge of past ages in those matters where our own judgment may be employed with equal or greater certainty; they may really have a natural affinity to each other without being obviously so in their external characters. Cestaceous animals are called fishes by the bulk of mankind, though the naturalist is fully satisfied they have scarcely any other relation to fishes than exterior figure, and living in the same element. The opinion also that crabs and lobsters are infects, as Linnaeus describes them, is sanctioned by the authority of so many writers of ability that we cannot be too cautious in venturing to discontinue an opinion so well supported. It is a matter of diffucion that claims the most mature deliberation of the naturalist, and fortunately one that has undergone investigation by men well qualified for the task, or it would be impossible to do it justice within the limits of our present article. The leading particulars may be explained; and if from the result of this it should appear that the crustaceous ought really to be separated from infects, neither the opinion, nor the example of Linnaeus, or his admirers, should deter us from moving them to a more applicable station in the scale of zoology. The question is plain, and resolves itself to this point. Is Linnaeus correct or not in placing the cancer among infects? and if he is wrong in this respect, not the cancer alone, but the monocyclus, and other true crustacea, must be rejected, as well as the cancer genus, to some new order or tribe perfectly distinct from and independent of entomology.

Were it not for the following characters which the crustaceous possess in common with infects; there are circumstances attending them that might at once forbid us to place them where Linnaeus has. Like infects they are furnished with antennae, and with limbs divided into joints, and in these essential particulars approach so near the apertorous order
Cancer.

orderd infects, that it would seem almost as confident to
end the whole apterous order from the systen of ento-
ology as to deprive it of the genus cancer. These reafions
have weight with many, and among others with Fabricius.
This writer, to whose entomological knowledge we ought
not to deny considerable prævice, is a tower of strength on the
Linnaen side of the question; for like Linnaeus he admits the
crustacea as infects, although he invariably rejects the
Linnaen mode of classing them; however therefore he may
differ from Linnaeus in syflematic arrangement, he affords
him countenance in the main material point under immediate
consideration: namely that the crustacea, and of course the
cancer, are genuine infects.—But the arguments on the other
side are also strong, and in the minds of some may be equally
convincing.

It is worthy of remark that our countryman Pennant, a
writer, whose knowledge of entomology was considerably
limited, should be the first among modern writers who pre-
sumed to divide the crabs, lobsters, and marine oniæ from the
infect tribes, after the Linnaean Systema Naturæ had been
early adopted throughout Europe, and that without
having any other motive than a desire to include those
crustacea in his British Zoology. He had but a small ac-
quaintance, as he himself expreſſes it, with infects, and
therefore took the liberty of separating the crustacea from
infects that he might treat of the former of them (Zoothe.
v. 4. Brit. Zool.). Mr. Pennant was not at that time aware
that crustacea might accede to such a separaſſion as he
had bruck out by accident, from a conviction of its being
both natural and juſt; but this has ultimately proved to be
the cafe at leaft to a certain extent.

The idea of crustaceous animals being infects prevailed
among the continental naturalists from the time of Linnaeus
till very lately. Cuvier was perhaps the first who attended
with decisive accuracy to the internal organizations of those
creatures, if we except Zoſfel, whose investigations, though
laborious, were not well directed. (vid. Inſecten-Beſtättigung,
&c.) The reſult of thoſe anatomical obseruations made on
them by Cuvier are intereſſing. They go far to demonſtrate,
or rather they eſeſially prove, that the cruaſſea, and in-
fects are perfectly diftinct from each other. Linnaeus, it
need be fearſely repeated, separated the caceaeous animals,
such as whales, porpoifes, &c. from the fifth tribe, where
they had been previously placed by authors, and to which
they are fo cloſely allied in figure and habiſt, because their
internal organization did not accord with that of fish; and
proved from the reſult of anatomical obseruations, that not-
withstanding their external form they are of the mammalia
tribe, having a heart with two auricles, and two venicles,
body warm, and laſtiferous teats, and for theſe reafons re-
fers them to the fame order as man and quadrupeds whose
internal organization corresponds. The feae arguments will
bear good in this inſance, and if the reaſons of Cuvier are
correct, crabs, and various other cruaſſea are certainly not
infects. Cuvier found the inteıral organization of cruau-
cean animals to be very different from that of infects. In his
"Leçons d'Anatome Comparée," he affirms that cruau-
cean animals breath and reſpire by means of gils in the fame
manner as mollusca, whereas in infects the organs of reſpira-
tion are aſcertainment from the experiments of Reaumur,
Swammerdam, and Malpighi, to be distributed along both
fides of the body; the small lateral spiracles, which we see
one on each side every annulation of the body of an infect
being the openings, through which the air is received into
the tracheal organs; and no ſuch spiracles are found on the
fides of cruauſsea animals. Cuvier likewise found that the
heart of cruauſsea animals ſeemed that of the mollusca,
being muscular, and ſupliefed with veſsels for the circulation
of fluids. La Marec in his "Syste煤ne des animaux fans in-
vertebre" follows Cuvier in a similar train of observation,
and mentions also, that although infects undergo one or
more changes, during which they ſeveral times call their
skin, this never happens after the infect has assumed its lat-
or perfect form (his arachnides, some of the Linnaean infects
of the apterous kinds excepted.) Crabs and other cruaau-
cean, he remarks, do not undergo any ſuch metamorſphoe as in-
fects; the skin or ſhell is of a different nature, being half
calca reous, and is renewed at ſlated periods, or annually,
the old one being thrown off and another growing in its place.
Infects, it is further observed, neither couple nor engender
more than once in their lives, which seems to be the fact with
all (ſome apters excepted); but the cruaauce, on the con-
trey, breed many times in the course of theirs. The cru-
auea, as is particularly noticed by Bole, have many pairs
of jaws, and antenna moſt commonly in greater number than
infects, the latter having never more or less than two, while
the others have almost conflantly four; and the antenna of
the cruauce are also of a very different ſtructure from thoſe of
infects. There are the moft material peculiarities in which
the cruaauce differ from infects, and which we cannot but
allow in our own mind to be ſufficient to justify the removal
of the cruaauæ from under the tribes of entomology.

Firſtly as we admire the merits aloft mentioned of the cruau-
cean, we should not presume to attempt the overthrow of a
part of his systen so confiderable as that under preſent con-
sideration upon trival grounds, but the reaſons against it are
cogent, perhaps unanswerable. We have ever been taught
by Linnaeus himſelf to regard the internal organization of
animals, as an effenſtial and uerifying guide in the natural
distribution of the tribes of zoology; it is by this ſtandard
the merit of his methodical arrangement of this tribe has
been appreciated, and it has fallen to the ground.

The cruaucean tribes, thus ſeparated from entomology,
must constitute a new and diftinct order of animals. Some
difficulty might aſſiſes as to the ſation in the systen to which
they ought to be referred. By placing them as a ſeparate
order immediately after infects, the innovation might create
the leaſt confuſion; but this is even liable to objection.
Cuvier arranges them between the worms and infects, the
worms, in his systen, contrary to that of Linnaeus, occur-
ing firſt. La Marec places them between the mollusca and
the arachnides, a new clas, comprising moft of the Linnaean
insects. (cruaauæ or trachea, the arachnides, which, as the
carcinæ, myrmexes, scorpionæ, and others that have ♂♂♂♂♂♂♂♂♂♂, or lateral ap-
tures communicating with the tracheal organs of reſpiration,
and which engender many times in the course of their lives.
Latreille's Tableau Methodique des Crustacées is placed be-
tween the ameletides (a clas of worms) and the infects, the
latter beginning with the arachnides of La Marec. See article
Crustaceous Animals.

To follow the French naturalists through the maxes of
the various systems propoſed for the arrangement of the crabs
and other crustaceous animals, is not within the compaſs of
our present design. Those naturalists feem only to agree in
the one decided point, that cruaauæ are not infects, each
having in turn rejected the mode of classification adopted by
his predecessor; to that no permanent arrangement has hith-
erto been formed, or perhaps ever may; and to embrace the
whole, full fluctuating even in the unnotated ideas of their
own authors, would only tend to create inexplicable con-
fusion. It will very likely be thought more thanſufficient,
by the faſtidious few, that the Writer of this deſcription has
followed them to far. In proceeding further he conserves the
propriety of forming a new order, as in the preſent state of
things.
things it would be impossible to pursue any of those already adopted. That which he proposes is moulded as nearly as possible to the Linnaean method. So far as the plain and simple rules of subdividing the cancer into families rather than genera, as laid down by Linnaeus, could be conveniently adhered to, his example is followed; the principal deviations are in those influences where alteration has been rendered necessary by the discoveries of recent naturalists in this tribe of animals, and which are of too much consequence to be overlooked.

The last edition of the Linnaean Systema Naturae comprises only a small number of the species of cancer at present known; his genus cancer is divided into several families, in which the whole of his crabs, lobsters, parasitic crabs, &c. are included. The Cancer genus is thus described. Legs eight, (rarely six, or ten) and two chelate hand-claws, or claws furnished with a moveable pincer; feelers six, unequal; eyes two, for the most part placed on peduncles, chelated, and moveable; mandibles horny and thick; lip triple; tail jointed, and unarmed. — The crabs are separated into two principal sections, brachyuran, crabs with short tails, and macruran, crabs with long tails, both of which are again divided into several families.

The crustacea are divided by Fabricius into many genera. The Linnaean cancer form a distinct class called agonata, in the Genera Insectorum of that writer, and comprehended five genera, namely, cancer, pagurus, scyllarus, affinis, and gammarus. His agonata class, in Entomologia Systematica, contains eight genera, crabs, hippa, squilla, and galathea being added to the preceding, besides some other families of crustaceous animals, as limulus, cynmthoza, and monochorus. The same author, in a later work than the foregoing Supplementum Ent. Syll. retains part of the Linnaean cancer together in his new class kieajagnatha, but divides them into many genera, which he names cancer, calappa, cycopede, leucosia, parthenope, inachus, driona, dorippa, orithyia, portunus, mature, hippa, and fymethis; and in his next class excobata includes the remainder of the Linnaean cancer in the genera abunae, scyllarus, palmarus, palamon, alpheus, affinis, peneus, crangon, pagurus, galathea, squilla, polydon, and gammarus. La Marek, it is clear, has derived material assistance from the last mentioned work of Fabricius. The syllera he proposes is very nearly allied to that proposed by Fabricius, as will appear on a cursory view of the following statement of La Marek's genera of crabs.

Crustacea pedestis. * Corps court, ayant une queue une fans feuilles, fans appendices latéraux, et applique sous l'abdomen. Genus crangon, calappa, cycopede, dorippa, portunus, podopthale, mature, porcellane, leucosia, mal, and arthropis. * * Corps oblong, ayant une queue allongée, garnie d'appendices ou de feuilles, ou de crochets. Genus, albunae, hippa, rmine, scyllare, cerevix, pagure, galathea, peneus, crangon, pagurus, squilla, branchiopode. And among his crustaceae feuilles, * Corps couvert de pieces crustaceae nombreuses, sont crevette (or gammarus), and chevreulle (caprella).

Latreille, in his Crustacees Malacostracés, further increases the genera of this natural tribe, constituting altogether thirty-nine genera of those which Linnaeus confines to the single genus cancer.

Several of the above-mentioned recently established genera we conceive it necessary to retain as genera, and others as subdivisions of the cancer family in a more compendious form in the following arrangement.

Crustaceous Animals.

First Order, Caneri Brachyurui, Linn.

Head not distinct from the thorax; body short, having a naked tail, without lateral appendages, or crochets, and folded under the abdomen.

Genus Cancer.

Mouth usually furnished with six feelers; mandibles thick and horny; eyes two, dilated, elongated, movable, and commonly placed on peduncles; antennae four, short, and bilobate, or setaceous, the inner pair (or sometimes both), bifid at the last joint; legs eight or six, and two chelate claws; body somewhat ovate; tail short.

Sub-Section. * Thorax smooth, sides very entire.

Species.

Grapsus. Front retuse, depressed, and armed with four; body variegated. Fabr. &c. — This is a native of the West India islands, where it is not very common. The colour is whitish, variegated, but most elegantly varied with rufous, or red speckled with white, or with minute dotings of red, with a few streaks of the same colour on a white ground, the red specklings pervading the whole upper surface both of the thorax and legs. The hand-claws are comparatively rather small, rough, and of a red colour, bordered with white; body beneath pale. — Cancer tenebricatus, of Haril's Cancer, of which he describes and figures a large and small variety (most likely the two sexes), is certainly a variety of the cancer graphis of Fabricius and Linnaeus.

Mutius. Thorax chevron-brown transversely on the anterior margin. Fabr.— A native of the Mediterranean Sea. The posterior part of the body is truncated; hand-claws smooth; arms denticulated beneath.

Quadratus. Thorax square; sides crenated; hand-claws febril. Bankain cabinet. Fabr. — A native of Jamaica. Size large, exceeding that of cancer uricola; the front inflected, and entire; eyes placed nearly together, and pedunculated; eye lid beneath crenated; thorax acute at the sides; hand-claws short; arms toothed at both sides; hands febril, with elevated dots; legs hairy; appears allied to the acypoda genus.

Kuricola. First joint of the legs spinous; second and third with tufts of hair. Fabr.— Cancer uricola. Linn.

This is the great land-crab of the Bahama islands, the history of which has been so amply detailed by Sloane, Cateby, Seba, and others, that the following particulars, selected chiefly from those authorities, may not prove unacceptable. ** These animals live not only in a kind of orderly society in their retreats in the mountains, but regularly march once a year down to the sea side, in a body of ten millions at a time, as they multiply in great numbers. They withdraw the month of April or May to begin their expedition, and then fall out by thousands from the stumps of hollow trees, which they excavate, from the holes which they dig for themselves under the surface of the earth, clefts of the rocks, and other hiding-places. At that time the whole ground is covered with this band of adventurers; there is no settling down one's foot without treading upon them. The sea is their place of deflation, and to that they direct their march, with the utmost precision. They never turn to the right or left for any obstacles that intervene, if they can possibly pass over them, and even if they meet with a house they will attempt to scale the walls. But though this be the general order of their route, they, upon other occasions, are obliged to conform to the face of the country, and if it is intersected with rivers they are seen to wind along the course of the streams, but if only a small rivulet occurs, they force their passage across it. The preceding sets forward from the mountains with the regularity of an army under the guidance of an experienced commander. They are said to be commonly divided into three battalions, of which the first...
Cancer.

consists of the strongest and boldest males, that, like pioneers, march forward to clear the route, and face the greatest dangers. They are often obliged to halt for want of rain, and to go into the most convenient encampment till the weather changes. The main body of the army is composed of females, which never leave the mountains till the rain is set in for some time, and then descend in regular order, being formed into columns of fifty paces broad, and three miles deep, and so close that they almost cover the ground. Three or four days after this, the rear guard follows, a straggling undisciplined tribe, consisting of males and females, but neither so bold nor so vigorous as the former. The night is the chief time of proceeding, and if it rains by day they do not fail to profit by the occasion; and they continue to move forward in their slow uniform manner. When the sun shines and is hot upon the surface of the ground, they halt, and wait till the cool of the evening. When they are terrified, they march back in a confused disorderly manner, holding up their nippers. They try to intimidate their enemies by clattering their nippers together, as if it were to threaten those that come to disturb them. Their disposition is carnivorous, though they most commonly subsist on vegetables; for if any of them by accident are maimed, in such a manner as to be incapable of proceeding, the rest fall upon and devour it upon the spot, and then pursue their march in the usual manner, sometimes two, or perhaps three months, in this manner, they arrive at their defined spot on the sea-coast, and then proceed to cast their spawn. The eggs are as yet within their bodies, and not excluded and retained, as is usual with animals of this kind, under the tail, for the creature waits for the benefit of sea-water to facilitate their exclusion. For this purpose the crab has no sooner reached the shore than it goes eagerly to the edge of the water, and lets the waves wash over its body two or three times. This has been thought necessary by some to ripen the spawn in the ovaria, as the crab, appearing satisfied with this light bathing, immediately retires, and seeks a lodging on the land. After this, they say, the spawn grows larger, is excluded out of the body, and adheres to the eiliated, or hairs under the tail. This bunch is seen as big as an hen’s eggs, and exactly resembling the roes of herrings. In this state of pregnancy they once more seek the shore for the last time; and flinging off their spawn into the water, leave them to the chance of fortune and accident to bring them to maturity. At this time whole shoals of hungry fishes are at the shore in expectation of this annual supply; the sea to a great distance seems black. At this time and about two thirds of the eggs are immediately devoured by those rapacious invaders. The eggs that escape are hatched under the land; and soon after, millions at a time of the little crabs are seen quitting the shore, and slowly travelling up to the mountains. The old ones, however, are not so active to return; they have become so feeble and lean that they can hardly crawl along, and the flesh at that time changes its colour. The molt of them, therefore, are obliged to continue in the flat parts of the country till they recover, making holes in the earth, which they cover at the mouth with leaves and dirt, so that no air may enter. There they throw off their old shells, which they leave, as it were, quite whole. At that time they are quite naked, and almost without motion, for six days together, when they become so fat as to be delicious food. It is said they have then under their linacous four large white fomes, which gradually decrease in proportion as the shell hardens, and when they come to perfection are not to be found. At that time the animal is seen flowing making its way back; and all this is commonly performed in the space of six weeks. This animal, when possested of its retreats in the mountains, is impregnable, for only subfiding on vegetables it seldom ventures out; and its habitation being in the most inaccessible places, it remains for a great part of the season in perfect security. It is only when impelled by the desire of bringing forth its young, and when compelled to defend into the flat country, that it is taken. At that time the natives wait for their defeat, in eager expectation, and destroy thousands, but disregarding their bodies, they only seek for the small spawn which lies on each side of the formic, within the shell, of about the thickness of a man’s thumb. They are much more valuable on their return, after they have cast their shells, for, being covered with a skin resembling soft parchment, almost every part, except the formic, may be eaten. They are taken in the holes, by feeling for them with an instrument; they are sought after by night, when on their journey, by flambeaux light. The inflant the animal perceives itself attacked, it throws itself on its back, and with its claws pinches most terribly whatever it happens to fall upon. But dextrous crab-catchers take them by the hinder legs in such a manner that the nippers cannot touch them, and thus they throw them into their bags. Sometimes also they are caught when they take refuge in the bottoms of holes in rocks by the sea-side, by chopping a flake to the mouth of the hole, which prevents their getting out; and then, when the tide coming, enters the hole, and the animal is found upon the water retiring, drowned in its retreat.

These crabs are of various colours, some are reddish, varied with black, some yellowish, and others bluish, inclining to blue. Those of a light colour are esteemed most, and when full in flesh are well tasted. In some of the fugar islands they are eaten with apprehension of danger, and form no inconsiderable part of the food of the poor negroes.

Pardius. Thorax oblong, with three teeth in front; eyes large and kidney-shaped. Herbst.


Body size of a small walnut. Colour entirely olivaceous, inclining to fuscous.

Aurantius. Thorax entire at the sides, and retuse before; front truncated and emarginate; hand-claws glabrous; legs compressed. Herbst.

Moderately large; general colour dully orange, or brownish on the thorax; legs paler and more obscure, lal joints furrowed longitudinally.

Corinus. Thorax undulated; hand-claws heart-shaped below, and muricated. Lin.

A large species, being somewhat larger than the ordinary size of our edible, or pound-crab, Cancer pagurus. The prevailing colour of the body tawny-brown, inclining to fuscous; legs pale fuscous, and emarginate at the edges. Inhabitants Surinam.


A small species of crab brought from New Zealand by sir J. Banks. The snout is short and exserted; thorax slightly depressed, and surmounted with a very entire margin; tail conic; legs smooth.


This
This kind has the front inflected and entire; thorax an elevated, acute, and entire margin. Arms large, projecting, and three-spined at the tip; hand-claws large, ovate, smooth, with incurved pincers. Antenna twice the size of the body. Posterior legs filiform, thighs canaliculated.

**HEXAPUS.** Thorax orbiculate and toothed in front; antenna longer than the body. Fabr. Linn. &c.

Body rather larger than a pea; hand-claws large; colour pale tawny. Found in European seas.

**PLATYCHELES.** Thorax smooth, orbicular, very entire; hand-claws flat beneath and ciliated; antenna very long. Herb. Penn. &c.

Herbst describes *Die kreiselförmige*, the name by which he calls this crab, as being rare in Europe. His figure is copied from that in Pennant’s zoology, upon the authority of which he records it as an English species. It occurs chiefly in our country, on the south coast of Anglesea. Muf. Dorow.

**ANATUR.** Thorax smooth, globular, crenated, very entire; hand-claws short, pincers two-edged. Herb. Die calteinenabbare.

**CANCELLUS.** Thorax smooth, crenated; margin of the breast prominently crenated; hand-claws two-edged; arms crenated. Mus. Herb. Linn.

Body roundish, about the size of a horse-bean; hand-claws rather long and linear. Colour pale brownish, dotted with white; claws and legs slightly fereinose.

**HISTRIS.** Thorax slightly orbiculate and smooth, with two teeth on each side; tip between the eyes three-toothed, the middle one largest. Scopoli.

**SCOPOLINUS.** Thorax subrotund, smooth, somewhat convex above; antenna capillaceous. Herb. Nutrix of Scop.

**ANTENNATUS.** Thorax subovate; antennae three times as long; hand-claws wedge-shaped. Forkel.

**PHILEGRUS.** Thorax convex, and fifteen-toothed behind. Linn. This inhabits Asia.

**CASSIDENS.** Head shielded, emarginated; arms with filiform appendages. Forster. Gmel.


**TALICUNA.** Thorax orbicular and very entire; hand-claws municated. This crab is four inches in breadth, fuscous, and becomes red in boiling. Fieh excellent. Inhabits Chili.

**GRANARIUS.** Thorax subovate, smooth, very entire; front cuspitate; eyes cylindrical. Fabr. Slabber.

A minute species of most extraordinary appearance; hardly larger than a grain of wheat. Thorax somewhat ovate, front conflating of a thick obtuse spine, having a smaller one on each side at the base; the large tubular or cylindrical eyes are placed behind them. General colour pale yellowish. Found in the fresh waters of Europe, but rarely.

**MINUTUS.** Thorax smooth, very entire, somewhat square, with the edges rather sharp; legs compressed. Linn. Cancer nutrix of Scopoli. Frequent in deep waters.

**PUSILLUS.** Thorax smooth, square, very entire, with a single tooth on the tarth. Herb. Linn. &c. Inhabits the North Seas, and is greatly allied to minutus, but is not more than one fourth its size, and is therefore extremely small; it is also depressed and of a pale colour.

**Section.** Thorax smooth, and cut at the sides.

**CORALLINUS.** Thorax obovate, one-toothed; front three-toothed. This inhabits India, and exceeds the ordinary size of our largest English crab, cancer pagurus. The thorax is of a fine coral red, variegated with a few whirih

This...
CANCER.

This is a large species, the legs expanding about twelve inches; the thorax is nearly quadrangular, and moderate in size. Colour pale brown.

MARMARIUS. Thorax smooth, with a single lateral tooth, white with rufous spots; front three-lobed; middle one emarginate. Herbf.

Thorax rufous, elegantly characterized with white; legs pale yellow; hand claws with a large rufous spot on each joint.

MACULATUS. Thorax smooth, with a single lateral tooth, yellowish with rufous spots; front three-lobed; middle one emarginate. Herbf.

Except in colour, this differs very little from the preceding, and may possibly be only a variety of it.

AMPHIPRITIE. Thorax tuberculated, with four dilated teeth each side; front two lobed; under surface of the hands and pincers fusceous.

Expands seven inches; general colour fine orange faintly spotted; legs variegated with indented fusceous marks. Perhaps a variety of floridus. Muf. Herbf.

DAINA. Thorax, and upper surface of the hand-claws tuberculated; thorax broad, and narrowing anteriorly; sides crenated with teeth; front with two distinct tubercles.


DORCAS. Thorax rather unequal; front obtuse, and two-lobed; sides compressed, somewhat emarginate, and toothed; hands and legs carinated; pincers black.

Size of the foregoing; thorax blue above; chelate arms and legs tectaceous brown.

METIS. Thorax unequal, with smooth tubercles; front cleft, with two emarginated lobes; margin with five teeth each side. Herbf.

Smaller than C. donee; colour pale; legs and arms moderate. Muf. Donov.

PANOPE. Thorax convex, granulated; front obtuse, with granulated margin, and cleft in the middle; sides four-toothed; pincers of the fore-claws black brown.

Smaller than cancer massae, and somewhat similar in figure; general colour olivaceous; upper surface of the hand-claws granulated and red. Herbf.

TYCHE. Thorax unequal, flat, tuberculated with granules; front advanced, obtusely rounded, and cleft; sides bidentated with two truncated warts; upper surface of the hand-claws tuberculated.

Cancer Tyche. Herbf. Smaller than the last, and of a dirty ash-colour; the tubercles on the hand-claws orange.

ELECTRA. Thorax unequal, and almost flat, tuberculated, and minutely granulated; sides five-toothed; front four-toothed; hand-claws granulated and dentated; pincers rounded, and blackish at the tips. Herbf.

PETRA. Thorax smooth, fusceous, with yellow spots; sides with a single tooth; front three-lobed. Herbf.

PHILE. Thorax smooth, and very glabrous; sides with a single tooth; front three-lobed, the middle one emarginate.

Length two inches; colour dusty olive. Herbf.

OCYRIS. Thorax smooth, somewhat tuberculated, with fusceous ocellate dots; side with a single tooth; front slightly truncated, and furrowed in the middle. Herbf.

CYMODOC. Thorax flat, depressed, nearly square, with a single spine on each side, somewhat truncated in front, and fix-toothed; inner margin of the arm dentated.

CALYPSO. Thorax convex, unequal, tuberculated, and granulated; sides three-toothed; front two-lobed, and granulated; hands granulated, and hispid; legs tectaceous.

EURYNOPE. Thorax flattish, tuberculated, and granulated; four jagged spines on each side; front with many teeth.

Size moderate, colour reddish brown, except on the legs, which are brown faciated with whitish: arms and hands prickly; front of the thorax crenulated, with about thirty teeth. Cancer eurynone. Herbf.

POLYDORA. Thorax unequal, slightly convex, tuberculated, and warted; hands warted; pincers fusceous; legs tuberculated with spines.

PRINCEPS. Thorax elevated in front; sides emarginate; dish streaked transversely with series of fuscous dots; legs banded with purple.

About the middle size; colour ochreous, dotted, and spotted with fuscous. Herbf.

PARVULUS. Thorax three-toothed at each side, and marked with impressed lines above; front entire.

Very small. Inhabits the shores of the American islands.

PAGUS. Thorax with nine obtuse plaits at each side; pincers of the hand-claw black at the tip.

This inhabits most of the rocky shores of England, and other countries of Europe, and is said to be in the highest perfection for the table about Chirillias. The flesh is much esteemed, as being more palatable and wholesome than that of any other kind of crab.

USBECUM-DENTATUS. Thorax nearly smooth, with eleven crenulate teeth at each side; proboscis three-toothed; fingers black at the tip.

A native of America. Thorax rather dilated behind, with crenated or rather ferrated teeth at each side; legs and hand-claws somewhat hairy.

SPINIFRONS. Thorax five-toothed at each side; second and third tooth bifid; front and hands many-splined. Fafr.

AENUS. Thorax very rugged, obtuse, and four-lobed at each side.

Inhabits India. The legs are compressed, varied with grey and rufous; lip doubled, and dotted with black; thighs with a black spot in the middle; hands small.

OCHTODES. Thorax unequal, obtusely toothed at each side; proboscis bifid; hands warty. Herbf.

Nearly the size of Cancer massae; pale flesh colour. Thorax with four, five, or six obtuse teeth at each side; arms and hands of the fore claw tuberculated.

LACTATUS. Thorax with four ferrated lobes at each side; hands ovate and smooth. Herbf.

*** Section. Thorax hairy, or fuscous on the back.

CHIRIS. Thorax hairy, suborbicular unarmed; hands ovate, and mucrinated. Linn. Inhabits the Indian Ocean.

SETOSUS. Hispid; thorax orbiculate, and tuberculated; front bifid and inflected.

Inhabits Chili. Described by Molin.


CRISTATUS. Thorax prickly; proboscis projecting; bifid, and crested; legs prickly. Rumphi.

GERMANUS. Thorax unequal, with a spine on the front, and another above the tail.

Inhabits the German Sea. The body is very minute; front with an ovate plate or lamina between the eyes, terminating in a spine; tail round, and conflating of five globular joints.

AVIRUS. Thorax one-spined in front, with the back sulcated and forth.

A species of small size that inhabits Iceland. Shell with a small
a small erect spine behind the eyes; arms one spined at the base and tip; thumb with a single tooth.

**Cruentatus.** Thorax tuberculated and red; front linear and truncated; Spotted. Includes the Mediterranean; body spotted with white at the tip; hands oblong; smooth, and armed with two teeth, and at the back.

**Hepaticus.** Thorax semi-circular, gibbous, and warly; the margin serrated. Herbill. A native of America and India.

**Scribunus.** Thorax tuberculated and flatish; the margin prickly; hands ended at the inner margin. Described by Herbst as an inhabitant of India.

**Genus Dorippe.**

Antennae four, the exterior ones fuscous, interior palpi-form; thorax somewhat heart shaped and wide at behind; hand-claws two, terminating in pincers; four posterior legs prehensile, and usually folded over the back.

**Lanata.** Thorax heart-shaped, unequal, depressed, hairy, and four-toothed in front; tail with fix teeth at the base.


**Fazincho.** Thorax smooth; margin very entire, with eight teeth in front. Der manis, Herbill. Pale brown, and twice the size of the following.

**Mascarone.** Thorax smooth; margin very entire, with fix teeth in front. Der mascarell, Herbill.

The two last mentioned species have the back of the thorax singularly indented with waved lines, that bear the resemblance of a grotesque human face; colour pale fuscous.

**Frascone.** Thorax tuberculated, entire; anterior part lobed and dentated. Herbill.

Colour brownish; hand-claws and two posterior pair of legs hairy; first joint of the two anterior pair hairy, the rest naked.

**Austua.** Thorax heart-shaped, depressed, and hairy; anterior part four-toothed; tail smooth. Fabr.

**Caliida.** Thorax heart-shaped, depressed, naked; front quadridentated; tail ciliated. Fabr.

**Dromia.** Thorax hairy, five-toothed each side; four posterior legs equal.


**Cancer lanatus.** Rumpf.

**Aegoprola.** Thorax globular, unarmed, and very hairy; pincers naked, and dentated within.

Dromia aegoprola. Fabr. Suppl.

**Artificiosa.** Thorax dawry, depressed, three-toothed at each side; posterior legs large.


Obs. There is reason to apprehend that several species of crabs described on the authority of naturalists in the gen-

**Genus Portunus.**

Antennae four, unequal, small, and jointed; the exterior ones fuscous and longest, interior palpi-form; body large, short, and dentated at the edges. Legs ten, the posterior pair terminated in an ovate plate, or swimmer.

† Division. Thorax bilobed at each side.

**Vigil.** Thorax smooth; arms spinous. This is a native of the Indian Ocean. Size moderate, eyes approximate, and situated upon very long peduncles; anterior tooth on the thorax much longer than the posterior one.
**Truncatus.** Thorax heart-shaped, pubescent, truncated in front, and eight-toothed.

Nearly allied to the two former, but differs in having the thorax broader, truncated in front and all the teeth smaller and more obtuse.

**Fasciatus.** Thorax in front eight-toothed; legs banded with purple, pincers scarlet. Herb. Donov.

**Callianassa.** Thorax fix-toothed; hands spines, and papillou at the angles. Herbil. Colour uniform dirty olivaceous brown.

†††† Division. Thorax with eight teeth on each side. 

**Menestho.** Thorax downy, truncated, and four-toothed in front, posterior lateral tooth large; arms of the fore-claws spines. Herbil.

A large species; thorax above ochraceous brown, legs fame paler.

†††† Division. Thorax with nine teeth on each side.

**Tranquebaricus.** Thorax smooth, with four teeth in front; arm dentated. Fabr.

A native of Tranquebar. This kind is eaten in the East Indies. The thorax is glabrous. Muf. Daldorff.

**Pelagicus.** Thorax smooth; posterior tooth large; hands multangular.


**Sanguinolentus.** Thorax smooth; posterior tooth very large, and three fangainous spots on the thorax. Herbil. Der Blutleech.

Commonly confounded with pelagicus, but certainly a distinct species: it has three red spots on the back of the thorax, and one on each hand, by which it may be readily known. Pelagicus is smaller, the thorax more rounded; posterior spine slender, and outline very diffimilar.

**Defensor.** Thorax smooth; posterior tooth short; front four-toothed, middle ones very short.


**Hastatus.** Thorax rugos; posterior tooth large; front four-toothed; teeth equal.


**Armiger.** Thorax somewhat smooth; posterior tooth large; front five-lobbled; arms dentated on both sides.


**Gladiator.** Thorax downy; posterior tooth large; hands spotted with fangaineous. Daldorff. Inhabits the Asiatic seas.

**Reticulatus.** Yellow reticulated with green; thorax four-toothed in front; posterior lateral, tooth very long.

Cancer reticulatus. Herbil. Above the middle size; prevailing colour yellowish; fore-claws reticulated reddish, fingers red. This is a most elegant species.

**Forceps.** Thorax smooth; posterior lateral tooth largest; fingers very long and filiform. Fabr. &c.

Rather small, and entirely of a pale bluish green colour. Herbil.

**Ponticus.** Thorax rugos; posterior lateral tooth large; hands filiform, fingers short. Fabr.

Smaller than cancer menas; colour pale brown. Muf. Donov.

**Cedonulli.** Thorax smooth, punctured; posterior lateral tooth large; dentated and emarginate, green with yellow spots; hand-claws elongated and multangular. Herbil.

This appears both in size and other particulars to nearly allied to portunus reticulatus, that they may be considered almost as varieties of this same species.

**Hastatoides.** Thorax downy; posterior tooth large, with a single small tooth each side behind. Inhabits the Indian Ocean.

††††† Division. Thorax elong-ovate, with three or more nearly equi-distant spines along each side.

**Marmillaris.** Thorax somewhat aculated and obtuse, with a three-pointed lobe in front; on each side a distinct fuscous mammilated spot. Muf. Donov.

Fabricius constitutes a new genus of this species in his Suppl. Ent. under the name of orithia. It is the only species of this genus known.

* Section. Murita.

Antennae commonly four, the inner pair of four joints, with the last joint bifid, the two exterior short, and scarcely visible; the hand-claws armed with pincers; all the legs terminating in an ovate plate or swimmer.

**Victor.** Thorax dotted all over, lateral margin sub-dentated, the posterior tooth very large.


**Palipes.** Posterior part of the thorax fricated. This inhabits the Indian Sea. Muf. Daldorff.

**Genus Calappa.**

Antennae four, nearly equal; exterior ones setaceous; interior of four joints, the last bifid; body short, enlarged behind; margin much dilated, and concealing the legs when folded; legs eight, terminating in claws; hand-claws two, hands compressed, and armed with pincers.

**Fornicata.** Thorax smooth, crenulated; posterior dilated, angles very entire; hands crenated.


**Tuberculata.** Thorax tuberculated, and many toothed, posterior dilated angle with crenated teeth; hands dentated.

Discovered in the Pacific Ocean. Muf. Bank. Cancer tuberculatus, Fabr. Ent. Syft. The thorax of this species is gibbous, with many tubercles and two impressed lines; snout short, obtuse, and somewhat reflected at the margins; legs simple, fingers fricated, and red at the tip; second joint of the hands tuberculated and acute; hands tuberculated.

**Granulata.** Thorax somewhat smooth and crenated; posterior dilated margin five-toothed; hands crenated.

Cancer granulatus, Linn. Inhabits the Mediterranean. This is a large species, of a pale yellowish, or cream colour, with several oblique roundish tubercles, of a reddish colour, on the fore part of the thorax, and a few on the under side of the hands.

**Marmorata.** Thorax somewhat plated, with three teeth on each side; front crenated and emarginated; arms dilated and toothed at the tip.

**Lophos.** Thorax slightly plated, and crenated on both sides; hind-margin dentated, and six toothed, the posterior angles dilated and five-toothed each.

Cancer lophos, Muf. Herbil. Inhabits the East Indies.

**Cristata.** Thorax slightly plated, and crenated on both sides; hind-margin with seven teeth; dilated posterior angle with three-teeth; hands crenated and toothed. Inhabits China. Muf. Donov.

**Angustata.** Thorax smooth, crenated on both sides with teeth, the posterior one narrow and smooth. Inhabits America. Muf. Lund.

**Gallus.** Anterior half of the thorax tuberculated; both sides crenated and dentated; the posterior dilated angle five-toothed; hands tuberculated above. Herbil.
**Cancer.**

Two or four antennae, small, quadriarticulate, and inserted between the eyes. Body subglobular, more or less convex, and generally inflated; tail naked; legs eight, and all furnished with claws; hand claws two, terminating in pincers.

**Species.**

**Division Ⅱ with ovate hands.**

**Scabiuscula.** Thorax depressed and scabrous, front emarginate.

The body of this species is small, depressed, and rough, with elevated whitish dots. This inhabits India.

**Globosa.** Thorax slightly curved; tail with two tubercles at the base; arms rough. Fabr. A curious species, discovered on the coast of Malabar by Dr. Koenig. Its size is small, figure somewhat globoso; arms rough, hands filiform. Herbist describes it under the name of *Die kugelkrabe*, Cancer globus.

**Crancklarios.** Ovate, very glabrous, or polished; anterior part projecting, and armed with three teeth; hands two-edged and smooth. Linn. *Die Henrichsharkrabe*, *Herbit*.

Body about the size of a small walnut, or rather less, the colour dark brown, slightly tinged with faint red and purpure; the claws are of the same colour, except the pincers, which are pink; legs brownish. This inhabits the shores of Malabar. *Muf. Donov.*

**Porcellus.** Thorax very glabrous, or polished, ovate, obtuse at the anterior part; arms granulated. Fabr. *Die porcellankrabe*, Cancer porcellus, *Herbit*.

This species is about the same size as the preceding, and somewhat resembles it in form, but has the anterior part obtusé, and without teeth; the lateral margins of the thorax are granulated; general colour pale brown, with the two extreme joints of the hand-claws bluish. Inhabits Tranquebar. *Muf. Donov.*

**Pila.** Thorax globose, with a single obtuse elevated tooth in the middle, and the margin crenated with teeth.

Inhabits India. The body is small, globular; front obtusé; hand-claws short and smooth.

**Planeta.** Thorax orbicular and flat; sides bidentated; front with three teeth.

This is a minute species, and inhabits Terra del Fuego.

**Urania.** Globose, highly polished; anterior part projecting and roundish; arms arched, hands smooth. *Herbit*.

An elegant kind of crab, nearly allied to Cancer crani-laris in figure, but above twice the size. The body and hand-claws are olive-sinuous, with some obscure rufous spots: from the tip of the front a broad white stripe descends nearly to the centre of the thorax, where it ends in a broad termination. The pincers of the hand-claws, and all the legs are yellow spotted with ferruginous.

**Division Ⅱ with filiform hands.**

**Punctata.** Thorax ovate, crenated, and three-toothed behind; fingers unarmed.


**Fugax.** Thorax oblong, three-toothed behind; middle tooth longest and recurved; fingers dentated.

Frequently confounded with the preceding species, but is certainly distinct. *Muf. Donov.*

**Nucleus.** Thorax orbicular, with two spines behind; arms granulated.


**Septemspinosa.** Thorax with an elongated and very acute spine on each side; five spines behind.

**Cancer hytrix, Fabr. Ent. Syll.** Inhabits the Indian Ocean.

**Cylindricus.** Thorax with two furrows; sides dilated, cylindrical, and spinous at the tip.

Inhabits Tranquebar. This is of a small size; front obtuse, and grooved in the middle; thorax with two large grooves, and a transverse one on the fore part, all hairy; sides of the thorax whitish, with red dots, rough, and armed at the tip with a strong acute spine; tail whitish, and rough, with two longitudinal grooves in the middle; legs and arms very thin. *Fabr. &c.*

**Eriaceus.** Thorax ovate and very spinous; marginal ones longest and dentated; arms prickly.

Described from the cabinet of Spengler, by Fabricius, as an inhabitant of the Indian Sea.

**Genus Oxyphoe.**

Antennae four (sometimes two), very short, and unequal; peduncles of the eyes lengthened, inserted in a central projection of the head, and extending along the front to the lateral angle of the thorax; body almost square; legs ten, armed with claws, the anterior pair, or arms, terminated in pincers.

**Ceratophthalma.** Thorax dotted; eyes prominent, and terminated in a spine.

Cancer curviro, Linn. Cancer ceratophthalma, Fabr. Ent. Syll. and Pallas, and Cancer curviro of Herbit and Gmelin. This is a species of moderate size, being rather larger than *Mena*; this inhabits the Mediterranean and Indian seas, from whence, about six feet, it comes up the shores, and wanders about the sand, running at intervals with great velocity. The right claw is commonly larger than the other; both are scabrous, as also are the legs, though only in a flight degree. The general colour is brown.

Fabricius supposes the two species, Curviro and Uca, of Linnæus, to be both of this kind, the latter being only an accidental variety, in which the cancer is marked with a rude figure, somewhat resembling the letter H.

**Heterochelos.** Thorax granulated; hand of one arm much larger than the other.

Cancer vocans, Linn. Cancer vocans major, *Herbit*. *O. Heterochelos, La Marc. Inhabits Jamaica, where it con-ceals itself under stones, and when caught, emits a kind of cry. Size of our common crab, Cancer Mena.*

Obs. Herbit has the figure of another species nearly allied to the above; in form the same, but not above one fourth of the size. This is called Cancer vocans major; perhaps the young, or a variety of the preceding, Cancer minor palustris, *Heterochelos* of Plumier. M. S. G.


Colour pale brownish; arms long, and flamed with rufous. *Muf. Donov.*

**Angulatus.** Thorax smooth; oblong, with two spines at the anterior part of the lateral angle. Cancer angulatus Linn. *Ocyphoe bipinosa*, La Marc. *Muf. Donov.*

**Levis.** Thorax smooth, with a single tooth at each side; hand-claws very smooth, right hand longest. Inhabits the Indian Sea. *Daldorff, Fabr. Suppl.*

**Minuta.** Thorax smooth, with a single tooth at each side; hand-claws very smooth and equal. Inhabits the isle of France. *Muf. Daldorff, Fabr. Suppl.*

**Brevis.** Thorax short, plated, with three teeth at each side; hand-claws long. *Herbit, Suppl.*

Moderately
CANCER.

Moderately small, colour in general pale brown. Muf. Donov.

Vocator. Thorax rugose, anterior part fissuous; right hand very large. Herb. Suppl.

Body somewhat gibbous at the sides, and narrowing rather behind; colour of the thorax; left hand-claw, and first joints of the legs dark red, the first variegated with black; large claw, and extreme joints of the legs pale brownish. Muf. Donov.

Genus MAJA.

Antennae four, the interior ones palpiform, exterior fetaeous; body ovate and tubicose, much enlarged behind, and narrowing towards a point in front; legs eight, armed with claws; hand-claws terminated in pincers.

Species.

* Section. Parthenope, Fabr. Arms of the chelate-claws usually very large.

GIRAFFA. Thorax spinous, spines ramose; hand-claws very long and tuberculated beneath. Inhabits the East Indies. Muf. Daldorff.


REGINA. Thorax unequal; margin spinous; hand-claws very long, with spinous angles. An inhabitant of the Indian seas.


LAR. Thorax unequal, four toothed; margin spinous; hand-claws smooth. This is a native of the East Indies. Muf. Daldorff.

ERIOCHELES. Thorax aculeated, hands ventricose, and spinous; fingers tufted with hairs. Cancer Eriocheles of Olivier.

Cancer maja, Linn. Parthenope maja, Fabr. Inhabits the northern parts of Europe, and England. Muf. Donov. Milkaken by Peayatt for Cancer Horridus. This is a large species.

DUBIA. Thorax smooth, three toothed in front; hands compressed, and ciliated; posterior legs very short and dolfal. Inhabits the Indian sea.

MURICATA. Thorax hairy, unequal, with a dorsal line and two dorsal spines on each side; marginal spines four; legs hairy.


CONTRARIUS. Thorax very unequal, tuberculated, and spinous, the front projecting and pointed; hand-claws muri- cated; legs simple, and banded with rufous. Herb. Body three inches in length, hand-claws six inches long and very large; colour pale brown in general, tips of the pincers of the fore-claws black.

ECHINATUS. Thorax heart-shaped, warted, aculeated; arms and hands of the chelate-claws echinated; legs muri- cated. Muf. Donov.

* Section. INACHUS. Fabr. Arms of the chelate-claws usually short or moderate.

HYBRIDA. Thorax hairy, unequal, with a dorsal line, and two dorsal spines; marginal spines four; legs naked at the tip.

INACHUS HYRIDUS. Fabr. Suppl. Very much resembles the foregoing, but is distinct. Inhabits India.

OVIS. Thorax ovate, hairy, with four spines each side.


Cancer hiricus, Herb. Inhabits the East Indies.

HIRUS. Thorax woolly, tuberculated; arms muri- cated; hands smooth.


ARANEUS. Thorax unequal; margin crenated on both sides; anterior part dilated and acute.

Opilio. Thorax prickly; margin three-toothed behind; hands somewhat smooth.

In the cabinet of Prof. Vahl. Inhabits the Mediterranean.

CONSUELA. Thorax covered with prickles; stout long, bidental to five-toothed above; one beneath. Inhabits the Norway seas. Muf. Vahl.

CHIAGRA. Thorax tuberculated, unequal; stout flat, acute; legs tuberculated. Muf. Donov.


ANGUSTATA. Thorax attenuated in front, and smoothish; stout projecting, bearded, and unmarginate at the apex. Inhabits the East Indies. Body minute; thorax smoothish with entire margin; legs spinous; hand-claws short, hands smoothish, the rest spinous.

SCORPIO. Thorax pubescent, with four erect spines; anterior legs very long.


PHALANGIUM. Thorax pubescent, with three acute spines on the anterior part, obtuse tubercles behind; stout bifid.

Common in Northern seas; frequent on the coast of England.

LONGIROSTRA. Thorax prickly, projecting, ascending, stout acute and bifid.


LONGIPES. Thorax prickly; hands ovate and scabrous; posterior legs very long.


Rumpf.

SETICORNIS. Thorax ovate, smooth, stout very long, and frerated on both sides. Herb.

PLANISSIMA. Thorax quite flat, and nearly square, with five teeth on each side, front trifid with spines; inner margin of the thighs, and first joint of the hand-claws dentated. Herb.

HIRTICORNIS. Thorax heart-shaped, unequal, dentated; front with two long, approximate, hirsute spines.

Thorax about the size of a small walnut; legs moderate, chelate; claws nearly the same size as the anterior pair of legs, or rather less; the whole slightly spinous, somewhat hairy, and of a fulvous colour. Muf. Donov.

DAMA. Thorax ovate, and granulated, with seven spines on each side; front with two ramose spines of three branches; arm and joint below the hands of the chelate claws very spinous. Herb.

Length of the body three inches; legs, and chelate claws
claw moderate; thorax brown; hand claws pale brown; legs blackish. Mut. Donov.

CORNUS. Thorax ovate, unequal, with four spines at each side, front four-furled, the interior pair very long. Herbst.

From three to four inches long; hand claws full formed, arms four-touched; thorax pale, oblique; legs darker. Mut. Donov.

SQUINAUD. Thorax obvate, unequal, pricked with lateral spines; front bifurcated; chelate claws moderate and full formed, arm and joint below the hand pricked; legs unarmed. Mut. Donov.

Cancer Squinado. Herbst. Habits European seas, and is a large species.

PHILIPPA. Thorax obvate, granulated, and unequal; snout very large, broad, square, and four-touched in front; hand-claws small and glabrous. Herbst.

Rather small, length one inch and a quarter, colour pale, legs faint yellow, spotted obscurely with reddish.

THALIA. Thorax ovate and granulated; sides spinous; front truncated, with two acute incurvated spines; hand-claws very small.

Length almost two inches; prevailing ferrugineous; hands black or blackish.

CHRYSONIS. Thorax somewhat ovate and tuberculated; anterior part much advanced, and armed with four long curved, horn-like spines.

PLATE. Thorax conic, tuberculated and spinous, with two long spines in front; hand-claws and legs unarmed. Herbst.

This is about an inch and a half in length; thorax pale brown, the two anterior spines approximate at the base, and curving a little to the sides upwards; legs pale fulvous, the first pair longer than the chelate claws.

STYX. Thorax ovate, tuberculated, warty, inout simple, and forck'd at the apex; anterior pair of legs thick, and hispid. Herbst.

Half the size of the former; hand claws very small; colour brown, pale on the thorax.

CANCER. Second Order. Cancrini Marenz. Linn.

Head not distinct from the thorax; thorax oblong, with an elongated tail, furnished with lateral appendages or crochets.

GENUS ASTacus.

Antennae pedunculated, unequal, the exterior ones long and fetcuous, inner pair divided at the extremity; body elongated; legs commonly ten; tail foliaceous.

Species.

Section*. Inner pair of antennae two-claw'd or bifid.

GAMMANUS. Thorax smooth; proboscis toothed at the sides, with a double tooth on each side, at the base; hands smooth.

Cancer gammanus. Linn. A'iacus Marinus. Fabric. This is the common lobster, a species frequent in all the northern parts of Europe. It is most abundant with us in the northern extremity of Scotland, but is far more frequent than ever there on the coast of Norway. In a general point of view we can add little to the history of the lobster beyond what has been already related by Mr. Pennant, upon the authority principally of Mr. Travis of Scarborough, and of which we shall avail ourselves in this place.

The lobster inhabits, says Mr. Pennant, all the rocky shores of our island, but chiefly where there is a depth of water. In Llyn in Carmarthenshire, a certain small bay, nothing different, except in size, borders in the land. In addition to this we must observe that the larger lobsters we have ever seen, I one from the coast of Scotland excepted, were taken in the lobster traps near the front of that part of Carmarthenshire mentioned in Mr. Pennant, and though to very large their flavour was delicious.

Lobsters are brought in vast quantities from the Orkney islands, and many parts of the eastern coast of Scotland to the London markets; (but the metropolis, in which they are chiefly caught, with lobsters at most seasons of the year, from the coast of Norway, and these latter are in more esteem for the table than the Scottish kind). Mr. Pennant mentions in his travels in Scotland, in 1769, that sixty or seventy thousand lobsters are annually brought to London from the neighbourhood of Montrose alone. Lobsters fear thunder, and are apt to call their claws on a great clay; it is said they will do the same on the ringing of a great gun, and that when men of war meet a lobster boat, a jocular threat is used, that if the matter does not fill them good lobsters they will salute him. When irritated, or in heat, the lobsters frequently throw off their claws, and the same happens commonly when those poor animals are plunged into the boiling pot for dressing. When first caught, or taken or entangled only by the claw, they will throw it off with a sudden jerk, and so effect their escape.

The habitation of this species, as Mr. Pennant tells us, is in the clearest water, at the foot of rocks that indwell upon the sea. This has given opportunity of examining more closely into the natural history of the animal than many others, who live in an element that prohibits most of the human researches, and limits the inquiries of the most inquisitive. Lobsters are found on most of the rocky coasts of Great Britain. Some are taken by the hand, but the greater quantity in pots, a fort of trap formed of twigs, and baited with garbage; they are formed like a wire-manufact-trap, so that when the lobsters get in, there is no possibility of returning. These are fastened to a cord sunk into the sea, and their place marked by a buoy. They begin to breed in the spring, and continue breeding most part of the summer. They are highly prolific. Dr. Baker says he has reared 12,444 eggs under the tail of one female, besides those that remained in the body unproduced. The eggs they deposit in the sand, where they are soon hatched. Lobsters change their tails annually like other crustaceous animals. Previous to their putting off their old one they appear fleshy, inoue, and restless. They totally acquire a new coat in a few days after casting off the former one. During the time that they remain defended they seek some very lonely place, for fear of being attacked and devoured by such of their brethren who are not in the same weak situation. The circumstance of the reproduction of the claws in lobsters, though surprising, is sufficiently well known: lobsters, as well as crabs, will renew their claws, if by accident they are torn off, within the space of a few weeks after the mischief has happened. They are very voracious animals, and need on sea-weed, garbage, dead bodies, and similar food.

Mr. Travis communicated some interesting particulars relative to the history of the lobster from a variety of observations made by himself on the coast of Scarborough. Lobsters, he observes, are found in vast numbers, and very fine, upon that coast. The larger ones are in general in their best season from the middle of October till the beginning of May. Many of the small ones, and some few of the larger, are good all the summer. They are, in general, from four to four inches and a half from the tip of the head to the
the end of the back shell. Commonly the pinchers of one of
the lobster's large claws are furnished with knobs, and those
of the other claw serrated; with the former it keeps firm hold
of the flanks of submarine plants, and with the other it cuts
and mines its food very dexterously. The knobbed or numb-claw,
as the fishermen call it, is sometimes on the right, and
sometimes on the left indifferently. It is more
dangerous to be seized by them with the cutting claw than
the other, but in either case the quickest way to get dif-

gaged from the creature is to pluck off its claw: a new
one will be produced in its place, though it will never attain
the size of the former. The female, or hen lobster, does not

call her shell the same year that she deposits its ova, or in
the common phrase, the berry. In the fall when the ova first
appear under her tail, they are very small and extremely black, but
they become in succession almost as large as ripe elder berries
before they are deposited, and turn of a dark brown colour,
especially towards the end of the time of her depositing
them. They continue full, and depositing the ova in con-
stant succession as long as the black substance can be found
in their body, which, when boiled, turns of a beautiful red
colour and is called the coral. Hen lobsters are found in
berry at all times of the year. It is a common mistake that
a berried hen is always in perfection for the table. When
her berries appear large and brownish, she will always be
found exhausted, watery, and poor. Though the ova be
call at all times of the year, they seem only to come to life
during the warm summer months of July and August.

Great numbers of them may then be found under the
appearance of tadpoles swimming about the little pools left by
the tides among the rocks, and may also under their proper
form from half an inch to four inches in length.

In calling their shells, it is hard to conceive how the
lobsters are able to draw the flesh of their large claws out, leav-
ing the shell entire, and attached to their body; in which
state they are constantly found. The fishermen lay the
lobsters pine before calling, till the flesh of its large claw is no
thicker than the quill of a goose, which enables it to draw
its parts through the joints and narrow passage near the
trunk. The new shell is quite membranous at first, but
hardens by degrees. Lobsters only grow in size while their
shells are in their soft state. They are chosen for the table
by their being heavy, in proportion to their size; and by
the hardness of their shells on the sides, which when in
perfection will not yield to moderate pressure. Barnacles
and other small shell-fish adhering to them are esteemed
certain indications of superior goodness. Cock lobsters are
in general better than the hens in winter: they are dif-
tinguished by the narrowness of their tail, and by their
having a strong spine upon the centre of each of the trans-
verse processes beneath the tail, which support the four
middle plates of the tails. The fish of the lobster's claw is
more tender, delicate, and easy of digestion than that of
the tail. The Scarborough fishermen do not take lobsters
in pots as is usual in flint and deep waters; they use a bag-
net fixed to an iron hoop, about two feet in diameter, and
suspended by three lines like a sela. The bait is commonly
fish-guts tied to the bottom and middle of the net. They
can take none in the day-time, except when the water is
thick: they are commonly caught in the night, but even
then it is not possible to take any without the sea, for that lu-
sinous appearance which is supposed to proceed from the
wetness of the shell. In summer the lobsters are found near the
shore, and there to about six fathoms depth of water; and
in winter they are seldom taken in less than twelve or fifteen
fathoms. Like infels, they are much more active and alert in warm weather than in cold. In the water they can
run nimbly upon their legs, or small claws, and if alarmed,
can spring, tail foremost, to a surprising distance as swift as
a bird can fly. The fishermen can see them pass about
thirty feet, and by the swiftness of their motions, suppose
they may go much further. Athenaeus remarks this cir-
cumstance, and says the incertus lobsters will spring with
the alacrity of dolphins. Their eyes are raised upon move-
able hairs, which enables them to see readily every way.

When frightened, they will spring from a considerable dis-
tance to their hold in the rock; and, what is not least fur-
prising than true, will throw themselves into their hold in
that manner, through an entrance barely sufficient for their
bodies to pass: as is frequently seen by the people who en-
due caverns to take them at Fishy bridge. In frothy weather,
if any happen to be found near the shore, they are quite
torpid and support.

Body smooth, pale, and without spots; hands flat, above reddish, beneath yellowish, with a single raised line; legs yellowish. Size of the common shrimp.

Boreas. Thorax prickly, second and third pair of legs filiform. Fabr. Described in Phappe's voyage as an inhabitant of the North Sea. The proboscis is short, depressed, acute, grooved on both sides, with a strong tooth beneath.

Carinatus. Thorax with a dentate keel; proboscis short, recurved, and furnished with three teeth at the tip. The nature of this species is unknown.

Gonocladia. Thorax with a dentate keel; feelers spinous at the tips, body fuscos. Inhabits the Greenland seas. Smallest advanced, with three teeth above and two beneath; external pair of antennae very long, and variegated with red and white; anterior part of the margin of the thorax with three teeth, and back carinated with four; segments of the abdomen ending in a spine each side; middle leaf of the tail with two toothed lines.

Varius. Margin of the thorax with a single tooth; proboscis forked on both sides; body variegated. Described by Fabricius from a specimen taken in the Norway Ocean in the month of August. The external antennae are longer than the body, rufous with white spots. Thorax cylindrical, smooth, with a strong tooth above the eyes. Proboscis projecting, ascending, and forked both above and beneath. Abdomen cincture, with many oblique rufous bands; middle leaf of the tail tubulate; second pair of legs filiform, and longer than the rest.


Section. **Inner pair of antennae three-cleft.**

Jamaicensis. Proboscis forked above, beneath tridentate; arms and hands muriated, pinchers with a strong spine on the inner edge. Sloane, &c. Inhabits Jamaica.


Pennatus. Thorax smooth; proboscis projecting and forked on both sides, beneath smooth; fingers filiform.

This is smaller than the last. Margin of the thorax with a single tooth each side; hands short, ovate with linear acute fingers.

Crangon. Thorax smooth; proboscis short, and very entire; hands with a single movable fang. Inhabit most sandy shores of Europe. With us is known by the name of shrimp. Flesh delicate. This has only six legs; middle leaf of the tail tubulate; colour pale-yellowish, semi-transparent and dotted.


*** Family Palaemon.***

Antennae four; the interior short and bifid; exterior long, simple, with a scale or plate at the first joint of the peduncle.

Tamalus. Hand-claws unequal; the left hand small and filiform. Inhabits the Indian Ocean. Daldorff.

Avarus. Hand-claws unequal; short and subulate. Inhabits India. Daldorff. The inner pair of antennae blue; thorax smooth; snout sharp-pointed; four hand-claws, the anterior ones largest; right hand large and compressed; posterior pair very thin and filiform.

**O.** Tamalus and avarus are perhaps only varieties of the same species.

Rapax. Hand-claws unequal; anterior part of the thorax carinated; snout subulate. Daldorff. A native of the Indian Sea. Thorax smooth and glabrous; four hand-claws, the anterior pair of which has the right hand, sometimes the left hand large.

Malabaricus. Hand-claws unequal; right hand largest; legs filiform.

Inhabits the Indian Sea. Left hand longer than the right; (which is largest), and filiform.

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**Genus Longimanus.*** Hand-claws advanced, unequal, smooth; front straight, and of the same length as the antennae plates.

Inhabits the East Indies. The thorax is smooth, with two teeth on each side at the anterior part; hands filiform, projecting, smooth, the left one much longer; legs smooth.

**Brevenus.*** Hand-claws of moderate length; shining or pinchers rather short; protum ascending, and longer than the antennae plates.

A native of the East Indies. Muf. Daldorff. Smaller than *Longimanus*; snout compressed, and serrated on both sides; thorax smooth, glabrous, with two teeth on each side of the anterior part; hand-claws filiform, and rather longer than the legs, and smooth.

**Coromandelicus.*** Hand-claws of moderate length; pinchers rather short; front same length as the antennae plates. From the coast of Coromandel. Very similar to the preceding, of which it may be only a variety; it differs principally in the proboscis, being shorter as well as the pinchers.

**Tranquebaricus.*** Hand-claws long and filiform; hands ovate. Inhabits Tranquebar. Daldorff.

Snout ascending, rather longer than the antennae plates, and serrated at the back; hand-claws as long as the body, filiform, very thin and smooth; hands thick; legs filiform and smooth.

**Lar.*** Hand-claws projecting, equal, muriated; snout straight, and length of the antennae scales.

Inhabits India. Fabr. Thorax smooth, with two acute teeth on each side; snout compressed and serrated; legs muriated.

**Serratius.*** Thorax smooth and subcarinated; snout serrated on each side. inhabits the Norway Sea. Vahl.

**Fucorum.*** Thorax smooth; snout ascending, with five teeth at the apex. Lives among fucus. Daldorff.

**Squilla.*** Thorax smooth; proboscis forked above, and three-toothed beneath; margin of the thorax with five teeth. Fabr.

The prawn. Inhabits European seas.


***** Family Alpheus.***

Antennae four; the interior short and bifid; exterior long, simple, with a scale or plate at the first joint of the peduncle.

Tamalus. Hand-claws unequal; the left hand small and filiform. Inhabits the Indian Ocean. Daldorff.

Avarus. Hand-claws unequal; short and subulate. Inhabits India. Daldorff. The inner pair of antennae blue; thorax smooth; snout sharp-pointed; four hand-claws, the anterior ones largest; right hand large and compressed; posterior pair very thin and filiform.

**O.** Tamalus and avarus are perhaps only varieties of the same species.

Rapax. Hand-claws unequal; anterior part of the thorax carinated; snout subulate. Daldorff. A native of the Indian Sea. Thorax smooth and glabrous; four hand-claws, the anterior pair of which has the right hand, sometimes the left hand large.

Malabaricus. Hand-claws unequal; right hand largest; legs filiform.

Inhabits the Indian Sea. Left hand longer than the right; (which is largest), and filiform.
Genus Scyllarus.

Antennæ four, unequal; inner pair rather long, filiform, with the last joint bident; exterior ones depressed, flat, and dilated, and dilated with spines; thorax large, and usually aculeated or rough; body long; tail with swimming appendages; legs ten; no cheliform arms.

Species.

Arctus. Five spines on the anterior part of the thorax; plates of the antenna ciliated and aculeated.

Cancer arctus. Linn. Potitiqueiue. Jonnt. Umiknak. Müller. Urfa cafrata. Belon. and Der Bärenkrebs of Herbst. This is an inhabitant of mott sea. Its size is superior to that of the common lobster. The shells are tuberculated, of a brown colour, and spotted with yellow; legs spotted; thighs spines. Muf. Donov.


Orientalis. Scabrous; anterior part of the thorax at each side armed with three spines; eyes placed close to the foremost one. East Indies. Fabr. Muf. Donov.

The thorax of this species, which is of the middle size, is rough, with three distinct elevated spines down the back; colour pale brown.


Discovered in the South Seas. Its general figure somewhat resembles arctus, but is narrower; the thorax unequal, with crenated margin; claws simple.

Genus Palinurus.

Antennæ four, unequal, pedunculate; peduncle jointed; interior pair short; fctalaceous, bident, and unarmed; exterior very long, fctalaceous, and aculeated, or bifid; body elongated; legs ten, armed with claws dilate of pincers, and tufted with hair at their extremity.

Species.


Polyphas. Thorax very slightly spiny; legs marked with blue. Herbst.

Ornatus. Green, fides spotted with white, abdominal segments smoothish; nearly allied to homerus; shorter antenna, and legs blue, banded with white.

Inhabits the Indian Sea. Fabr. &c. Probably a variety of polyphas, and not sufficiently distinct from the following species, which is also introduced from Fabricius.


Genus Galathea.

Antennæ four, unequal and pedunculate; inner ones short, filiform, of three joints, that at the extremity bident; outer pair fctalaceous and long; body elongated; tail foliaceous; legs usually ten; arms chelate.

Species.


Length from five to seven inches when full grown; colour brown; tips of the pincers of the fore-claws red. Inhabits Europe. Muf. Donov.


Discovered by Mr. Cordiner on the coast of Bamiff, Scotland. Muf. Donov.

Gregaria. Thorax with ciliated plates; snout with three denticles; anterior feelers very long. Fabr.

Much smaller than the two preceding. It is found in the sea round the coast of Patagonia, where it occurs sometimes in such vast shoals that the sea appears perfectly red, that being the prevailing colour of them when alive; it has a brown spot on the back; and the hand-claws are rough, Muf. Bankf.

Amphicrins. Thorax smooth; snout very short and emarginate; middle pair of legs very long.

The body of this kind is small, whitish, subdianous, and dotted with red; thorax unarmet, roundish behind, and broad, and narrowing towards the front; four antennæ fctalaceous, and very long; abdomen of five segments; tail of five leaves, the middle one tongue-shaped.

This kind is highly luminous by night; it inhabits the Atlantic, near the coast of Brasil. Fabr. Muf. Bankf.

Genus Hippa.

Antennæ sometimes two, and pedunculate; commonly four unequal, and fringed with thick hairs; inner pair very short, and bifid; body oblong; tail with small lateral appendages at the joints next the base; legs usually ten, and delicate of pincers.

Species.

Adactyla. Thorax smooth, with very entire margin; tail infeffed, the last joint long, tubulate, and ciliated at each side; hand-claw without fangs. Inhabits the South seas: Bankfian Cab. Cancer Adactyla, Gmel.


Dorsifera. Thorax glabrous, truncated in front, and armed with seven teeth; hand-claws compressed, and furnished with a falcated thumb. Fabr. Cancer dorsifera, Linn.

This kind inhabits the Indian and Southern Oceans. Length of the body and tail about three inches. Thorax smooth, and of a whitish colour, the margins hairy and cre- nated; a small plate ciliated with denticles projects before the front. The outer feelers contain four joints, the first and second of which are long, ciliate, and compressed, and ciliated; tail thin; hand claws rough above, beneath smooth, pincers very short.


The thorax of this species is large, ovate, and rough, with elevated oblong dots, fides crenated; tail very short, infeffed and ciliated; hand-claws incurvated, hands large and rough, with
with two teeth on the superior margin, and five on the lower on: legs eight, compressed, and ciliated, the extreme joint ovate-lanceolate. Fabr. &c.

**Dentata.** Thorax smooth, with five teeth on each side; tarso-spinous. Fabr. Inhabits European seas.

Moderate size; glossy, pale color, with a tooth on each side, behind the eye, three in the middle, and one behind; arms twice the length of the body, and somewhat spinous.

**Scutellata.** Thorax nearly entire and ciliated; hands chelate. Fabr.

Described by Fabricius, from a specimen in the British museum. Native place unknown. It is small, with ovate thorax, rounded in front, and becoming narrower behind; hands smooth.

Gemelin adds to the above species, Cancharius of Linn. and Sinicus of Herbst, but expresses doubt whether they are of this family or genus.

**Cancharius.** has the thorax rugose, oval, hands compressed, and spinous at the margin. Linn. Inhabits South America and India.

**Sinicus.** Thorax somewhat compressed, oval, and spinous; arms and legs spinous. Herbst. A native of China.

* Section Symethis.

**Antenna two, very short, and containing four joints each.**


This species, arranged in the former works of Fabricius in the genus Hippa, forms a new genus, of which it is the only species in Supplementum Ent. Syr. under the name of Symethis, Fabricius having found that instead of four antennae it possesses only two, and those different in structure from Hippa. His genus Symethis is thus defined: antenna due brevissima, quadriarticulata, intra rostrum binae reconditae. Perhaps it ought rather to form a new genus than section of Hippa, in the present arrangement. It is of the middle size; five short and toothed; anterior part of the thorax with unequal impressed dots and obtuse teeth, smooth behind, with lateral rugosities; hands smooth; legs elongated, ciliated, and hooked at the tip. Muf. Spengler.

Obs. Fabricius in Supplementum Ent. refers five of the above described species to his new genus albuna; symmíta, coelitata, dorípes, scabra, and dentata.

**Genus Ranina.**

Antenna four, short; the two inner ones bifid at the extreme joint; body oblong, wedge-shaped, truncated in front; tail large, and ciliated at the edges; legs eight, the four posterior ones terminating in swimmers; hand-claws two, armed with pincers.

Species.

**Serrata.** Cancer raninus, Linn. ? Ranina serrata, La Marech. The thorax of this crab is aculcated, or covered with prickles; color fuscous; hairs that fringe the legs and tail yellowish brown. Inhabits the Indian seas. Rumph. and Herbst.

**Genus Squilla.**

Antenna four, nearly equal, and pedunculate; interior pair rather long and tridactyl, the exterior ones with an oblong plate; thorax long; tail very long, and enlarging towards the posterior extremity; legs fourteen.

Species.

**Maculata.** Hands with a single ten-toothed fang; body very smooth; tail five-toothed on each side. Fabr. Suppl.

**Manus.** Hands with a single six-toothed fang, subulate; tail serrated and spinous. Fabr. Suppl. Cancer manus, Linn.

Inhabits chiefly the Mediterranean and Asiatic seas. Eaten by the Italians and the Chinese. Length about five or six inches.

**Raphidia.** Hands with a single eight-toothed fang; body with two elevated lines on each side.


**Phalangium.** Hands with a single five-toothed fang, the first and third tooth of which are longest; body smooth. Inhabits the East Indian seas. Body smaller than S. manus, smooth, glabrous; tail segment serrated with spines. Muf. Dalldorf.

**Ichnesmon.** Hands with a single four-toothed fang; margin of the tail ciliated, with thick spinous protruberances.

From the East Indies. Muf. Dalldorf. Smaller than S. phalangium; body with three elevated lines on both sides.


**Ciliata.** Hands with a single three-toothed fang; two extreme joints of the abdomen ciliated with spines. Inhabits the Indian seas. Spengler.

**Chiagra.** Hands with a single fang, pubulate, with a rufous protruberance at the base. Fabr. Squilla arenaria of Rumphiuss. This is a native of the South Sea. Muf. Banks.


**Genus Pagurus.**

Antenna four, unequal, the inner ones short and bifid at the summit, the exterior flataceous, and usually longer; body oblong, thorax crufaceous; abdomen vesicular, naked, soft, and furnished at the tip with hooks or claws.

The species of this genus are mostly parasitical, and inhabit the empty cavities of turbinated shells, the animals of which they attack and devour to gain possession of their shell, and it is chiefly on the tesselaceous mollusca, or shell-fish, that they subsist. They change their habitation as they increase in growth, first occupying the shells of the common periwinkle, or trochus, then perhaps a nent as large as a walnut, and after that a whelk. But the paguri of climates warmer than those of Europe are often larger than with us, and require shells of considerable size for their habitation. The tail is naked and tender, being covered only with a skin of very delicate texture, but it is furnished at the extremity with one or two hooks, by means of which it secures itself to the shell which it makes choice of. It is astonishing with what facility those animals crawl both in the water and on the land, bearing at the same time the shell that serves them as a covering on their back. They are indiscriminately called soldier-crabs and hermit-crabs, from the idea of their living in a tent, or retiring into a cell.

Species.

**Latro.** Thorax at the future four-cleft; tail simple and ventricose beneath. Linn. Bouverges, Rochef. &c. A native of the East Indies. Inhabits the holes and cavities of rocks, from whence it wanders abroad in the night-time in search of cocoa nuts, which it procures by climbing up the trees, and throwing them down, then descending after them, and tearing them open with the two fore-claws.
The Indians eat the flesh of this kind of hermit-crab after taking out the entrails, which they think poisonous.

**Miles.** *Parafitic.* Left hand largest, and muricated on each side; legs with very long ferrated claws. Herb. Fabr.

A species of large size. inhabits the East Indies.

**Custos.** *Parafitic.* Left hand-claw largest; hand smooth; legs with very long smooth claws. Fabr.

A native of the East Indies, described in Suppl. Fabr. from the Museum of Dallorff; much resembles Miles, but is different.

**Diaphanus.** *Parafitic.* Depressed; left hand largest and smoothish; joint below dilated on the back. Inhabits the Indian sea.

**Aniculus.** *Parafitic.* Thorax ovate, ciliated at the sides; legs rugged, and hairy. Fabr. Derived from the Bankian cabinet. Inhabits the South Seas.

**Bernhardus.** *Parafitic.* Hand-claws muricated, the right one largest. Linn. An European kind.

**Hungerus.** *Parafitic.* Hands hairy and tipped with black, the right one largest, body banded with red. Herb. Fabr.

A native of India. Smaller than Pagurus Diogenes. Peduncle of the eyes pale with red bands; body smooth; legs and hands hirsute.

**Clypeatus.** *Parafitic.* Thorax smooth, very entire and compressed; left hand largest, and with the legs dotted. Fabr.

Body small, compressed, whitish. Antenna fusous; hands white, with purple dots, and a marginal blue spot. Legs white with innumerable dots and specklings of purple.

**Diogenes.** *Parafitic.* Hands muricated, pubescent; left hand largest. Fabr. Suppl. &c.

Called by Kempfer, Gani na al Koonal, and Medderman of Rumphius. Inhabits American and Indian seas. This, like most of its genus, inhabits empty shells; the general colour is pale tesselaceous or yellowish brown.

**Tubularis.** *Parafitic.* Subcylindrical; shell with excrated dots. Fabr.

Cancer tubularis, Linn. Inhabits the shells of Serpula glomerata in the Mediterranean.

**Oculatus.** *Parafitic.* Hand-claws muricated, equal; peduncles of the eyes as long as the thorax. Fabr.

Found chiefly in the shells of Murex Brandaris. Size of Bernhardus, our common hermit crab. Body entirely ferruginous; peduncles of the eyes advanced or projecting, cylinodrical, with a tooth at the base. Arms with a fanguineous spot on each side; hand-claws rough.

**Alatus.** *Parafitic.* Hands smooth, with three wing-like projections; right hand largest. Fabr. Inhabits Iceland. Dr. Koeng. Rather smaller than Bernhardus; joint below the hands rough; wing-like projections acute.

**Ophthalmicus.** *Parafitic.* Hands equal, muricated; legs faciculated with hairs; eyes clavate. Inhabits the Indian Ocean. Dallorff. Eyes large, and placed on short peduncles, at the base a small acute scale; hands smooth, equal, muricated, with hairs, rufous. Perhaps Cancer Chlamaricus of Herb. 

**Araneiformis.** *Parafitic.* Hands rough; tail callous at the tip, and furnished with a hooked tip. Fabr.

**Scopetarius.** *Parafitic.* Thorax smooth, entire; hands equal, granulated, thighs of the second pair of legs compressed. Herb. Der Mufkettier.

This is about half the size of Pagurus Bernhardus; colour pale brown, with a blue streak down the middle of the two anterior pair of legs, and peduncles of the eyes of the same colour.

**Tympanista.** *Parafitic.* Thorax smooth, very entire; legs fricated; claws marbled. Der Trummelschläger. Herb. Smaller than the foregoing; hands linear.

**Tricus.** *Parafitic.* Thorax smooth, and very entire; left hand-claw largest; hands and legs chefnut, whitish at the tip.

**Excavatus.** *Parafitic.* Right hand largest, with two excavations, and another similar on the movable pincer. Der Aufstehliche. Herb.

**Sclera.** *Parafitic.* Hands muricated, left one largest, whitish; inner sides bearded; eyes obliquely wedged, pedicle compressed. Forfkal, &c.

**Lagopodes.** *Parafitic.* Cincinnus brown; legs rough with hirsutes; left hand largest. Forfkal.

**Dusi.** *Parafitic.* Hands somewhat globular; that on the left side small. Herb. Muf. Donov.

**Canaliculatus.** *Parafitic.* Hands and joint below grooved, with elevated denticulate margin; legs with hairy tufts. Cancer canaliculus. Herb.

**Megasos.** Rufous with roundish white spots; hands and legs spinous, and hirsute. Herb.

A beautiful species, legs and claws vermilion; thorax paler and body inclining to purple, and sprinkled all over with distinct roundish white spots; half segment of the abdomen and base of the tail red, but the tail itself brown and immaculate. Size of a moderately small lobster, or rather less.

**Strigatus.** *Parafitic.* Thorax rather flat, and whitish; hands and legs rufous, with transverse streaks. Herb. Muf. Found in a volute. Smaller than Pagurus Bernhardus.

**Pedunculatus.** *Parafitic.* Thorax flat, depressed; peduncles of the eyes thick; left hand largest, inflated, and muricated. Herb. Muf. Donov.

General colour pale ferruginous; abdomen cinerous, marked with pale, yellowish at the tip; two posterior pair of legs pale.

**Arrosor.** *Parafitic.* Thorax flat; hands and legs with numerous transverse, irregular furrows. Cancer Arrosor, Herb.

**Crustaceous Animals.**

Third order, Crustacea artifices, La Marek.

Heads generally distinct from the thorax; eyes fixed and sessile; body long, and covered with many plates.

**Genus Gammarus.**

Antennae four, very simple and pedunculate; anterior ones short and tubulate; posterior setaceous. Head distinct, body small, oblong, compressed, linear, of many joints. Tail with many riles; legs numerous.

**Species.**

**Ampulla.** Hands without fangs; legs fourteen; posterior thighs compressed and dilated. Inhabits the North Seas. Phipps.

**Caninatus.** Hands without fangs; legs fourteen; back carinated, and spinous. Fabr. Larger than Gammarus Locula; body whitish, somewhat compressed, back carinated; segments somewhat spinous behind. Muf. Brit.

**Nugax.** Hands without fangs; legs fourteen; fix posterior thighs compressed and dilated. Inhabits the North Seas. Phipps Yor.

**Canellus.** Hands without fangs; legs sixteen. Inhabits rivers of Siberia. Onicus cancellus of Pallas.


**Locusta.** Hands four, without fangs; legs fourteen, thighs
CANCER, or Cancer, in Entomology, a species of Cancer (Hippa Fabr.) described by Linnaeus as a native of South America and India, the thorax of which is oval and rugged, with the hand-claws compressed, and spinous at the margin. CANCHE, in Geography, a river of France, which runs into the sea, near Etaples, in the department of the Straits of Calais.

CANCHY, a town of France, in the department of the Somme, 5 miles N. of Abbeville—also called, a town of the department of the Calvados; 10 miles W. of Bayeux.

CANCÓN, a town of France, in the department of the Lot and Garonne, and chief place of a canton, in the district of Villeneuve-d'Agon, 2 leagues W. of Montluçon. The place contains 1423, and the canton 3566 inhabitants; the territory includes 1023 kilometres, and 11 communes.

CANCRIFORMIS, in Entomology, a species of Cerambyx, found in South America. The thorax is armed with many teeth; back flat; wing-cases and anterior flanks with a single tooth. Fabricius. Obs. This is cerambyx pulluclus of Drury's illustrations.

CANCRIUS, in Poetry, denote the same with retrograde; which see.

CANCRIUS of Rampart, in Entomology, synonymous with Cancer Cursor. See Cursor.

CANCRIUS, in Entomology, a curious genus of flies, called in England the boat-hall. The structure of its body is very extraordinary, and has been described compared to an inverted boat, wherein its name; it is also gibbous, or swollen; nodules small, placed in a furrow; tongue small; toes divided.

Two species only of this genus have been hitherto discovered, namely, cochlearia and camposphaga, which see.

CANCROPHAGA, a species of Cancro, with a whitish belly. This is the cochlearia fuscus of Brill, the tamara of Maregraves, Ray, &c. and earlier use of Buffon.

CANCZUCI, in Geography, a town of Poland, in the palatinate of Lemberg; 35 miles W. of Lemberg.

CANDA, a town of Italy, belonging to the state of Venice, in the Polesin de Rovigno; 14 miles W.S.W. of Rovigno. Also, a river of England, which runs into the Eden at Carlisle.

CANDABORA, in Ancient Geography, a town of Spain belonging to the Celtiberians. The city.

CANDAHAR, or Kandakar, in Geography, a country of Asia, being part of the ancient Parthus, and situated between the two powerful kingdoms of Hindooostan and Persia, became alternately a province of the Mogul empire and of Persia, till it was again formed into an independent kingdom, as it had formerly been, by Ahmad Shah, one of the Afghan tribe of Abdali, who, from an obscure origin, rose progressively in the service of Nadir Shah, or Kuh Khan, to the rank of an Afghan prince. Nadir stripped him of his country, and compelled him to join his army in 1739. On the death of Nadir, he suddenly appeared among his former subjects, and, in a short time, erected himself as a considerable kingdom in the eastern part of Persia; adding to it most of the Indian provinces ceded by the Mogul to Nadir Shah. He died about the year 1753, and was succeeded by Timur Shah, usually styled king of Candahar, whose subjects, in 1782, are said to have lived under an easy government, considered as an Aryan one. At this time the military force of Candahar was estimated at 200,000 men. His predecessor Ahmad Abdalla had regular infantry, clothed like the Britih: yeomen, and, at one time, made use of the Britih manufactures for this purpose. The trade went by Sind, and up the Indus and its branches, to Cabul, but it has been long at an end. The successor of Timur was Zaman, whose chief subjects are Afghan, or the people of the mountains between Persia and Hindooostan, who may be considered as the founders of the empire; the others are Hindoos, Persians, and a few Tartars. Candahar is bounded on the north by the Gaur and the province of Balk; on the east by Cabul and the river Indus; on the west by Segeltan, and on the south by Arrokage, Mekran, Susee, and Mowlin. Befides Candahar proper, the empire in its greater extent includes Cabulistan, Ghizno, Cahlire, part of Segeltan and part of Choristan. See Cabul. Every part of this mountainous except that which lies towards Persia. The chief city is Candahar.

CANDAHAR, a city of Candahar, the kingdom above-mentioned, is ascribed by M. d'Availle and others to Persia. While the Persians and Mogul empires were severely divided, this was the frontier city and fortress of Hindooostan;
towards Persia, and was esteemed the key of the western provinces of the latter, and not unfrequently changed masters. As Cabul was considered in a political light as the gate of India towards Tartary, Candahar held the same rank with regard to Persia; and hence it has derived its chief importance. Major Rennell has shown that Candahar cannot be the same place, as some have supposed, with the Paromian Alexandria of Alexander. This city, says Turlier, in his "Journey from Bengal to England," comprised within an ordinary fortification of about three miles in circumference, and of a square form, is populous and flourishing; and lying in the great road which connects India with Persia and Tartary, it has been long a diffused mart. It is abundantly supplied with provisions; the fruits are of an excellent quality; and the extensive range of fields occupied by Hindoo traders attests the liberty and protection which they enjoy at Candahar. The tract of territory dependent upon it is said to produce a revenue of 18 lacs of rupees; and from the appearance of all classes of people, the collection seems to be made without any extraordinary rigour. The environs of Candahar occupy an extensive plain, covered with fruit gardens and cultivation, and intermingled with numerous streams of so excellent a quality as to become proverbial; and the climate is happily tempered between the heat of India and the cold of Ghizni. To the west there is a considerable defect, extending nearly to Herat, which renders the passage from Peris to Hindoo and difficult. Between the mountains of Hindoo Khoo, and those of Candahar, the country assumes the form of an extensive valley, from Cabul to the borders of Choristan; and in the tract between Cabul and Candahar, the highest point of elevation of the country is marked by the defile of the waters from it in almost every direction. The distance from Candahar by Cabul to Agraz is 1220 miles; to Benares, 1538; to Calcutta by Morehbad, 2155; by Birboom, 2047; and to Delhi by Cabul, 1071. N. lat. 33°. E. long. 65° 33′.

CANDAIL, a town of Persia, in the province of Melran; 148 miles E. of Kidge.

CANDANA, in Ancient Geography, a town of Asia, in Paphlagonia.

CANDASA, a town of Afa Minor, in Caria. Polybius.

CANDAU, in Geography, a town of the duchy of Comland; 24 miles E. of Goldingen.

CANDAVIA, in Ancient Geography, a county of Macedonia, mentioned by Caesar and also by Seneca, which lay at some distance E. of Dyrrachium. It was bounded towards the east by the Candavian mountains, from which flowed the river Panuas. These are supposed to be the "Cambavi montes" of Livy, and the "Canalivii montes" of Ptolemy.

CANDE', in Geography, a town of France in the department of the Maine and Loire, and chief place of a canton, in the district of Segré, ten miles S.W. of Segré. The place contains 948, and the canton 6,343 inhabitants; the territory includes 285 kilometres and 6 communes.

CANDEISH, a province of the southern part of Hindoostan, in the territory of the Poonah, or western Mahrattas, being one of the three fobahs formed by Acbar in the 16th century out of the conquests in the Deccan. It occupies the space between Malwa on the north, Berar on the east, and Amedangur on the west and south. Its soil is fertile, though mountainous, and it produces more cotton than any other province of Hindoostan. The revenue of this province under Aurungzebe, as stated by Mr. Frazer in his "Life of Nadir Shah," amounted to 112 lacs of rupees. The principal town is Burhanpour, which fee.

Candel, and Candel, in Botany. See Rhizomorph.

Candel, in Geography, a town of France, in the department of the Lower Rhine, and chief place of a canton in the district of Willembourg; the place contains 2366, and the canton 12,444 inhabitants; its territorial extent comprehends 1871 kilometres, and 16 communes.

Caneola, a town of Naples, in the province of Capitanata; two miles S.W. of Alcoth.

Candelabrum, in Architecture. This term, adopted from the Latin, is employed to denote the flanks or supports, in common use among the ancients, to place their lamps upon; or which were hollowed out in the upper part, in the form of a brasier or baloon, for the combustion of inflammable substances.

Candelabra are among the elegant and ornamental remains of antiquity, and curios, as they preserve the remembrance of primitive customs. The most ancient method of illuminating apartments during the night was apparently by burning dry and rufious wood, either in braziers, or more simply, by single branches like flambeaux: the use of oil and of lamps succeeded to these imperfect and inconmodious methods, and candelabra served to support the lamps.

In treating of Candelabra they are to be divided into the two general classes already intimated; those which terminate in braziers constitute the firft, and those which served as lamp stands, the second.

In the first class are comprehended the most remarkable for rize and magnificence; some of which, by their defamation reemble altars, and may even be confounded with them, were employed in temples and private chapels for burning incense. Cicero informs us, that not a house in Sicily was without these sacred utensils, made of silver. Candelabra of this kind are not uncommonly found represented in baffe relieves and on the frizes of temples.

Very large marble candelabra are found at Rome, where, as Winckelmann observes, not one of bronze has been discovered; these from their great size and elevation correspond to the vast halls of Roman edifices, which they illuminated.

The marble candelabra vary greatly in the shape, both of the brasier, and of the body or pillar which supports it; and many of them present models of taste, in form, ornament, and execution. The richest collection of these objects is published in the Museum Vatiiicum: two among these, which were found in the Barberini palace, are distinguished as the most splendid pieces of ornamental workmanship; the base is a triangular altar, having each face ornamented with a figure of a divinity; the shaft is composed of acanthus leaves disposed in tiers in the style of a Corinthian capital, so that one of these candelabra appears, at fiirt sight, a union of three Corinthian capitals placed upon one another; the other, which is the most beautiful, is varied in form by a tuft of acanthus leaves, which fall over like a canopy with a wonderful richness of appearance. The balloon of both is fluted, and by its form and ornaments corresponds with the magnificence of the whole.

Our own country possicles many ancient candelabra, two of admirable workmanship were presented to the Radcliffe library at Oxford, by Sir Roger Newdigate; they were found in the ruins of the emperor Adrian's palace at Tivoli.

Of the candel and clases of candelabra there is a very curious collection in the museum of Portici, which were found in the excavations of Herculanum and Pompeii. They are all of bronze, and were used for domestic purposes. In many of these we find the shaft representing a knotted cane, or a spiny branch, with truncated shoots and leaf stalks. They may be cited as examples of the taste of the ancients, in adapting ornaments to things of common use, to augment their utility, and,
and, at the same time, preserve the type of the objects which give rise to any useful invention. The buds and flowers represent ornament the shafts of the candelabrum, which would otherwise be too plain; they are convenient in affording a firm grasp to the hand, and at the same time they appear to give the history and agreeably recall the simple origin of these utensils. The same art which in stone and marble preferred the original forms of the wooden hut, has perpetuated in bronze the reed or flax, which supporting a tablet, formed the primitive candelabrum.

Among the considerable number of the candelabra in the museum of Portici there are many varieties. Their greatest height is five feet. The shaft of one of these is square, and on the upper part, immediately below the tablet upon which the lamp was placed, is represented a double head, one face of Mercury, and the other of Perseus. The greater number are in the form of a column placed upon a spreading base, composed of three paws, and above the shaft is placed a circular tablet, forming the lamp stand. The ornaments are various; in some the shaft is fluted longitudinally; in others, the fluting are formed spirally; and there is equal diversity in the capitals.

Candelabra of this kind are not employed by any modern European nation: the diffuse of these elegant utensils is owing to the circumstance of candles having superseded lamps.

In Italy the practice of placing round the altar large chandeliers seemed to be an imitation of ancient customs in this respect; the size and the shape even of some of these chandeliers preferre a tolerably just idea of the ancient candelabra, but they differ essentially from those in the socket necessary to receive the candle, and support it in a straight and immovable position, and ill more in the choice of forms and taste of ornament. The smell, or, at least, the moist and builded modern works of this kind, are the chandeliers of St. Peter's, the design of which is attributed to Michael Angelo. Notwithstanding the name of this great artist, the richness of the material, and the beauty of the workmanship, it must be confessed that their form is too much divided, the ornaments are capricious, and their proportion very insufficient for the situation which they occupy.

CANDELARES, in Botany, the sixty-second order in Linnaeus's fragments of a natural method published in the Philosophia Botanica. It consisted of Rhizophora, Minifopos, and Nyfia; but was afterwards abolished by him, and its three genera referred to the Holarceae.

CANDELARIA, in Entomology, a species of FULGORA peculiar to China, that possesses the power of emanating a clear and vivid light from the extremity of its snout in a similar manner to that emitted from the abdominal rings of our common glow-worm (lampyris noctiluca). It is specifically distinguished from the Fulgora, by having the snout ascended: wing-cases green with pale yellow spots; wings yellow, and black at the tip. Linn. Fabr. Donov. Inf. China. See also article Fulgora.

CANDELARO, in Geography, a river of Naples, which runs into the sea, 3 miles S. of Manfredonia.

CANDERN, a town of Germany, in the circle of Suevia, and margraviate of Baden-Dourlach; 11 miles N.E. of Bâle, and 72 of Strasburg.

CANDEROS, in the Materia Medica, a name of an East Indian gum not much known among us, though sometimes imported. It has much the appearance of common amber, only that it wants its yellow colour, being white and pellucid; we sometimes see it turned into toys of various kinds, which are very light, and of a good polish. Garcias and some other authors tell us, that Borneo, and some other places where camphor is produced, have the art of adulterat-
and the safety of the places that are entrusted to them. They also cause justice to be done by the Cadis, and order their sentences to be executed. Each pachalk is divided into a certain number of districts, and each district comprises a certain number of villages, of which some belong to the imperial mosques, and others to the sultan-mother: and the greater number are granted for life to agas, or lords, in consideration of a sum of money paid into the imperial treasury, and an annual quit-rent, which is lodged in the comptoirs of the treasurer of Candia, for the maintenance of the fortresses and the pay of the troops of the country. All land owners pay to the aga, to the mosque, or to the sultan, a certain amount of the produce of their lands; and they are obliged to carry their olives to the mills, which the agas alone have a right to cause to be constructed. Oil pays a tax. The police of the village belongs to the aga, who appoints, for subordinate administration, a foubachi, or subaltern tyrant. More greedy and more untractable than his master. No Greek can marry without the permission of the aga, which is to be purchased at a price; and the aga sometimes appropriates the female who is proposed for marriage to himself; and when he wishes to part with her, he marries her to some Greek inhabitant of the village, who does not refuse her. Married men are not allowed to quit the island, unless they are mariners, or merchants; but bachelors may go to work in the Morea, or elsewhere, upon paying a tax of 60 paras, or two piastres a head before their departure. If a murder happens in a village, or within its territory, and the delinquent be unknown, the aga must pay to the pacha a sum of money, which is levied on all the inhabitants, referring a part for himself. Taxes are arbitrary, and in their amount depend on the population and circumstances of the inhabitants. For the death of a mulufman, the fine is exorbitant, and is almost always attended by the death of several Greeks. The Turkish villages, as well as those of the Greeks, are subject to the police of the aga; but those which belong to mosques or to the sultan-mother, are less oppressed than the others. The Greeks can neither occupy employments proceeding from the government, nor can they be admitted into any corps of troops, unless they have embraced the religion of Mahomet. Thus the island, which long prospered under the laws of Minos, is now governed; and thus the inhabitants of a country where liberty in a manner took its birth, are bent under the yoke of the most ignominious slavery. Among the people, who at this day inhabit the island of Candia, we may reckon Abadiots, Muffulmen by religion, Arabs by origin, and some remains of the Saraccens whose ancestors formerly occupied it. The Abadiots are swarthy, meagre, and of middling stature, and in their disposition mild, fruitful, malicious, and vindictive; they go armed like the Turks, and kill each other on the slightest provocation. They occupy 20 little villages to the south of mount Ida, and form a population of about 4,000 persons. They afford an asylum to the Turks and Greeks who have committed any crimes, whom they themselves kill if they become troublesome. When they have an opportunity, they rob the friars in the Greek monasteries that lie within the reach of their villages. The inhabitants of the high mountains to the south of Candia and Retimo are considered as the real descendants of the ancient Cretans, and are known by the name of "Sphachiots." They are distinguished from the other Greeks by their tall stature, handomie, light of liberty, courage, skill, and above all, by the hatred which they have vowed against the usurpers of their island. These Sphachiots have found means to preserve their laws and their customs under the Romans, the Saracen, the Venetians, and the Turks. Obliged by the Turks to transport, in summer, from the tops of their mountains, the ice necessary for the consumption of the inhabitants of Candia and Retimo, they paid no tax nor import; they had no agas; they never faw among them the agents of the Turkish government; and they formed a republic, in some measure independent, till, in 1769, the Happenings which they enjoyed on their mountains was interrupted by the part they took with the Russians, and the Turks retaliated upon them their revolt by hideous measures that proceeded almost to their utter extirpation. The amount of the population of this island consisting of Greeks and Turks is estimated by Olivier at 24,000.

The climate of Candia has from remote antiquity been deemed singularly healthful, which has been attributed to the abundance of its salutary plants. Hippocrates best his patients thither to breathe the air charged with wholesome vapours. The Turks in the island of Candia, under the happy influence of its climate, have here acquired a taller stature, muscles more prominent and more strongly marked, broader cheek and shoulders, all the proportions which constitute beauty and strength, together with an imposing rep and carriage; although with all these advantages, the freemans of their conntenance gives to their majestic exterior a formidable impression. The Greeks, on the other hand, are of a stature less tall, a corpulence less prominent, a rep less solemn, a make less robust, but more graceful; and they seem to have degenerated under a climate which is natural to them, and in which they are abandoned to slavery, which alike degrades both the form of the body and that of the mind. The same disparity in the exterior attributes of the Turk and the Greek, is also observed among the women of the two nations. The Turkish women are there handomer than in the other parts of the eart; whereas the female Greeks have, generally speaking, fewer charms than they possess in several other countries. The dance of the Greeks of Candia is referred to a very remote antiquity. Homer (II. i. xvin. ub fin. Pope's version.) has described it; and it is the image of the labyrinth of Crete, of which it imitates the windings and turnings. It is serious and grave, though not destitute of simplicity and nobleness. Their songs are slow and languid, and the habit which the Greeks have of singing through the nose renders their songs still more dawling and left sprightly.

With the exception of the leprosy brought to this island from Afa, there are no contagious nor prevailing disorders in Candia.

One of the best cultivated and most productive of the provinces of this island is Kifiasams. To the south of this province is Selino, to the north of these two provinces is Cidonia, and to the south Sphachia. Three leagues from the town of Candia commences the province of Ascorsena, which extends to the south as far as Armires, and to the south as far as the mountains of Sphachia. This province is mountainous, and furnishes abundance of oil, but a small quantity of barley and wheat, and very little wine. It is more peopled by Greeks than by Turks. The province of Retimo is well cultivated and very productive. To the south of this are the two provinces of Asin-Vafali and Amari, furnishing wheat, barley, oil, and some fruits. The former, situated N.W. of the other, supplies also excellent chestnuts. In these provinces the Greeks are more numerous than the Turks. The part of the island that occurs in the north part of the island, after quitting the territory of Retimo, is called Nifo-Petamo. The province of Candia affords very little cotton, but abundance of wheat and barley, and a considerable quantity of raiifs, which last are shipped for the supply of Syria and Egypt. In this territory there are scarcely any olive-trees. The Turks are here as numerous as the Greeks. To the south of Candia lies the province of Meffara, which is reckoned
reckoned the granary of Crete; and to the east of Candia lies the province of Mirabel, to the south of which is the province of Hiera Petra, or Genni-Petra. The province of Setia occupies the whole eastern part of the island. For a more particular account of each of these provinces, see KISSAMOS, SELINO, &c.

Notwithstanding the various alimentary productions furnished by this island, the Greeks live through the whole year on barley bread, salted olives, and wild plants. The more delicate articles of sufficiency they fell in order to discharge the taxes, or to pay the too frequent extortions of their agas. Mutton and pork are everywhere excellent and cheap. Lambs and kids are always to be obtained in the three principal towns during several months of the year. The argali and wild goats are plentiful on the mountains. Beef is scarce, and the ox is little used but in rural labour. Poultry may be procured with ease, and at a cheap rate. Turkeys are sold at a very moderate price; and the island abounds with a great variety of birds fit for food, as the quail, turtle, ring-dove, loriot, roller, thrush, and fig-peckers. The woodcock passes the winter in this island, and the blackbird remains all the year. In spring and summer, larks, ortolans, and many small birds supply the place of birds of passage. The hare and partridge are very common. There are few countries in the Levant that afford a greater variety of useful and interesting vegetables than the island of Crete. Agriculture is subject to many discouragements and restraints in the island of Candia; and industry is checked by the oppression and rapine of the agas, pachas, and janizaries. Such is more especially the case in the villages and territories belonging to the Greeks. The Turks are less oppressed; and the Sphachiot, more sure of enjoying the fruits of his labour, exerts a greater degree of energy and activity. Public granaries are very common near the principal towns; they were probably constructed in the time of the Venetians, and consist of large square pits in masonry, coated with a cement capable of securing from moisture the grain contained in them. The opening is narrow, and carefully closed. As the island does not grow a sufficient quantity of corn for the supply of its inhabitants, a large quantity is annually imported from Volos, Salonica, the Morea, Syria, and Egypt. Wine is made only in a few districts; in others, the inhabitants prefer carrying their grapes to the town, or drying them for trade. The mulberry-tree vegetates very well in Candia, and silkworms thrive wonderfully; and yet the silk used in their manufacture is brought from Syria. Some cloths, in silk and cotton, and in silk and flax, are manufactured and consumed in the country. Flax, though tolerably plentiful, is not cultivated in sufficient quantity for the use of the inhabitants; a great deal is drawn from Egypt. Cotton is little cultivated; that which is consumed being brought from Smyrna and the environs of Ephesus. Sefamum is cultivated for the purpose of mixing its seed with bread, in order to give it flavour. One of the productions of Candia, which has preferred its ancient reputation, is wine, which, in some districts, is still delicious. It is well known, that Homer has praised the wine of Crete, and that Jupiter drank no other nectar during his stay in this island. The malvasy, which is made in the environs of mount Ida, is much esteemed; but all the Cadian wines must be drank with caution, as they are of a fiery quality, and apt to fly quickly to the head and to make the nerves. In several places forells of pines, cedars, and firs cover the declivity of the mountains, and crown the summit of the hills; and afford, by their straight and tall items, as well as by the resin which exudes from them, abundant resources for nautical purposes. On the mountains in the vicinity of Canea, and at the foot of mount Ida, grows a species of rock rose, (Cistus laurifolius, Linn.), which yields lauracum, or baldacum, serving for perfumes and the preparation of certain drugs. The horses of Candia, the race of which originally came from Barbary, have much degenerated in form and beauty. Nevertheless, none can be compared to them for strength and impleness of limbs, and for being sure-footed. The dogs of the island were formerly reckoned, on account of their fleetness and agility, the best in Greece, next to those of Lacedemonia. But, under the Turks, their race is degenerated. The dogs of Candia are a new species of large greyhounds, or courting dogs, which, with a little attention, might be handfome animals and very serviceable. The stray dogs and straying these animals are neglected. It is said that in Candia to carnivorous and venomous animals exists; and it is certain that if such quadrupeds once inhabited this island, their races have entirely disappeared. But the ancients have blazoned exaggeration with their accounts, when they assert that birds of prey would not flourish here. It was also alleged, without foundation, that the island of Candia was exempt from serpents, and other venomous animals. Pliny, however, has made an exception in favour of the phosphorus, or tarantula. Belon has observed, that three species of serpents were known here; and Sumini says, that there exists a species of spider as dangerous as the tarantula, which lives in subterranean retreats, and is of the species of the mason, or mining spider, circumstantially described by Latreille in the " Mem. de la Societe d'Hist. Nat." Whether the gecko (Lacerta gecko, Linn.) be found on this island is not absolutely certain; but it is not improbable, as it is met with in other countries of the coast, in the vicinity of the island of Candia, and particularly in Barbary and Egypt. The hydrophobia is said to have occasionally, though seldom, made its appearance in Candia; and Dapper mentions that this island has been frequently afflicted by mad dogs. The remedy purchased by the king of Prussia, and published in 1777, is known there. The insect that furnished this specific, which the Candians employed from time immemorial as a sovereign antidote to madness, is the melos, or oil-beetle, (Meloe prolarabaeus, Linn.) the larvae of which bear the name of "May-worms." In Candia it is reduced to powder, which the patient swallowed; and it is said to be of so active a nature, as to occasion convulsions, pains in the bowels, inflammations, agony, bleedings to the nose, bloody urine, and even death, when taken in too large a dose. Such dangerous means of cure have been wisely relinquished by modern practitioners. The multiplication of bees is a branch of rural industry, which is encouraged in this island. The ancients indeed feigned that Jupiter had been fed on the honey obtained from the bees of mount Ida.

The only articles of exportation from this island are, oil, soap, wax, honey, cheese, raisins, almonds, walnuts, cheunfts, St. John's bread, linseed, and liquorice-root. The imports supplied by the French consist of woolen cloths, laces, and fluffs, of Lyons, imperial ferges of Nîmes, small flot, tin, iron, steel, coffee, sugar, nutmegs, cloves, indigo, cochineal, paper, and various articles of hard-ware. Venice and Trieste supply glass-ware, hard-ware, and, particularly, planks for making soap-cafes; and Caramania, or Greece, furnishes almost all the wood necessary for the soap-houses. The islanders themselves carry on some trade: from Salonica they draw corn, cotton, tobacco, and iron; from Constantinople, Buria fluffs, Angora chafés, shoes, handkerchiefs, and copper utensils. At Smyrna they take hides, Turkey leather or Morocco, cotton, quilted coverlets, English shalows, and some French goods. At Gaia they purchase for their soap-houses at Aleppo, silk fluffs; and they purchase on the coast of Syria corn and silk. Egypt supplies them with corn and rice, flax, linen.
lacen-cloths, and after. Derma and Bengazi, on the coast of Africa, lend butter known under the name of Manteign, which is a mixture of butter and mutton-fish, used by the orientals in their ragouts and panty. Tunis and Tripoli exchange their crops and their corn for soap and liquors. The wool is coarse and short, and wholly consumed in the country. The hone is a well known article of commerce from Candia and Stancho.

The north coast of this island has the greatest number of harbours and roadsteads; in which are many excellent anchorages; but the south coast affords few places where a ship can rest in safety. The rivers of the island are principally torrents swelled in winter by the rains, and in spring by the melting of the snow; but they have a considerable number of springs, which the inhabitants use for the watering of their lands. During the three summer months, the excessive heat of the sun is constantly tempered every day, from eight or nine in the morning till the evening, by the rapid current of air which prevails from North to South on the northern coast of the island. This refreshing wind, called "enbat," takes its course, and is modified through the Levant, according to the direction of the coasts and the extent of sea which lies before them. In the island of Candia winter is, properly speaking, no more than a rainy season, during which the sky is more charged with clouds, and the heat less powerful, but never such as to make it necessary to have recourse to artificial warmth. However, in this season the mountains are covered with snow, and in some places it remains till the month of June.

Sorini's Travels in Greece, p. 209, 8c. Olivier's Travels in the Ottoman Empire, vol. ii. p. 100, 8c.

CANDIA, the Khondak of the Arabs, derived from chandax or candax, is a maritime town of the island above described, and, though less populous and commercial than Canea, reckoned its capital. Some geographers have supposed that its site is that of the ancient Cyzum; others suppose it to have been Mauum, and others again refer it to Heraulca. Olivier places Cyzum 4 leagues to the west, and Mauum 2 leagues to the east, and Heraulca 4 or 5 leagues to the east; and Candia he imagines to have been part Panormii, which lay, according to Ptolemy, between Cyzum and Heraulca. Candia is situated on a pleasant plain, intersected by beautiful hills, which share its fertility, and the ground on which it stands is supported towards the sea by a strong wall built on rocks, which affords an agreeable walk. The approaches of the place are defended by fort with several pieces of cannon, and it is guarded on the land side by walls of a solid construction, a good ditch, and some advanced works. The form of the town, consisting of straight streets and regular squares, and the substantial construction of the buildings, indicate that it is not the work of the Turks, but that it owes its existence to the Venetians; at the same time its present late announces the dreadful ravages of war, and the lover harrow of want, so that the houses constructed by them have disappeared. Here are still to be seen ruins which are the remains of the memorable siege which it sustained for twenty-four years, from 1646 to 1670, against the Ottoman forces. The decline of its commerce has changed its flourishing state and considerably reduced the number of its inhabitants, many of whom are removed to Canea, together with the foreign merchants. Although it is still the seat of the general government of the island, its population is disproportioned to its extent. It now contains scarcely 10 or 1200 Turks, 2 or 300 Greeks, and about 65 Jews. The Greeks, who inhabited it before it became subject to the Turks, followed the Venetians at the time of its capture, and made their escape into the country: nor have they returned to settle in a town, where their existence is incessantly threatened by the Janizaries, and their fortune frequently invaded by the Pachias. The handomest churches damaged by the above-mentioned siege have been repaired and converted into mosques; but the fortifications have been carefully preserved. To the south-west of Candia, the first chain of mount Ida rises in the form of a pyramid, and seems at a distance as a land-mark to navigators, who wish to anchor in the harbour of that town. The harbour is defended from the north wind by rocks, on which has been built a strong jetty parallel to the coast: it is very secure; and might contain from 30 to 40 merchant-vessels, if it were kept in proper order. But the Turks have suffered it to be choked up, so that there are no more than eight or nine feet of water in the infide of the harbour, and about 15 at its entrance. It affords accommodation only to a few small barns of the country: and merchant-vessels can only enter it in ballast, or with a fourth of their lading. To this and other circumstances it is owing that the trade of Candia is almost annihilated. Navigators who frequent the harbour of Candia have been furnished by a long series of observations with means of ascertaining the state of the atmosphere in the open sea, from the foal inspection of the chain of mountains which encircles the town to the south. When the cloud is collected in heaps above the most prominent of these hills, which bears the name of "Calepo," the weather is bad in the offing, and the wind almost always to the northward; navigators then take care not to quit the harbour. If, on the contrary, the ridge of the mountain is clear and free from vapours, they are certain of finding, without, the wind moderate and favourable for failing out of the gulf, and getting clear of the coast.

The environs of Candia present a few fertile plains that are cultivated, and some rising grounds susceptible of cultivation. At a little distance to the south is seen the insulatd pyramidal mountain already mentioned, at the foot of which is a passage to the ruins of Gortynia, and its labyrinth: to the Europeans this mountain is known by the name of Jupiter's mountain. To the south-west, mount Ida, covered with snow almost all the year, throws out on one side some branches towards the town; and, on the other, runs to join the mountains of Sphachia, covered in like manner with snow during eight or nine months. In this town there are 25 soap-houses, which employ the greater part of the oils of the island, and are situated in the east part of the island. Candia forms one of the three pachalkias of the island. See CANDIA. N. lat. 35° 10', E. long. 25° 18'.

CANDIA, a town of Italy, in the Milanese; 12 miles W. of Verceil.

CANDIA, a township of America in Rockingham county, New Hampshire, N. of Cheffer; about 36 miles W. of Portsmouth; incorporated in 1757, and containing 1040 inhabitants.

CANDIDA, in Conchology, a species of Arca, the shell of which is pellucid, rhomboid, produced in front, truncated behind, and decussated with lirae; beaks remote; posterior margin gaping, the opening ovate and ciliated. Chemnitz, &c. A native of the American and African shores. This kind is white, somewhat granulated, and covered with a blackish subfuscous epidermis.

CANDIDA, in Zoology, a species of Actinia, described by Muller as a native of the northern seas of Europe. This is smooth, with a rugose aperture, the tentacula reeling bristles, and dilated at the margin.

CANDIDATE, a person who sets up for some post or place, either of honour or profit. The word is formed of candida, white; on account of a white shining garment, toga candida, in which those who
aspired to preferments in ancient Rome were habituated, at the time of their appearing for the fame, especially at the public assemblies, in order to distinguish them from the crowd. The white gown worn by candidates was knotted and imitated, but was there any close garment under it, which some interpreters do as well as desire to avoid any suspicion people might have of bribery; though Plutarch rather thinks it done to gain the affections of the people, by being in such an humble garb; or else that such as had received wounds in the service of their country, might more easily exhibit those tokens of their courage and fidelity. The Roman candidates usually declared their pretensions a year before the time of election, which was spent in making interest and gaining friends. Various arts of popularity were practiced for this purpose, and frequent circuits made round the city, and visits and compliments to all sorts of persons, the proceeds of which formed what was called ambitus.

CANDIDATE OF BAPTISM, in the Ancient Church, was called catechumen.

CANDIDATES in the College of Physicians, London, is the order of members, out of whom the fellows are chosen. The candidates must be natives of England, doctors of physic, admitted to the degrees in our own universities, and ought to have practiced physic four years before they are admitted into the order. The number of candidates is never to exceed twelve. See College.

CANDIDATE, in Academic Orders or Degrees, denotes a person to whom, after full examination, and the performance of the degree exercise, licence is granted to take up the highest or doctoral dignity when he pleases. See Degree, Doctor, Licentiate, &c.

CANDIDATI PRINCIPI, were those who were recommended to any offices by the emperors. The candidatus principi was also an office in the court of the emperor of Constantinople, answering to a secretary of state among us.

The candidatus principi was denoted Quaestor principi, or Augustus.

CANDIDATI MILITIS. Among the Romans, these were soldiers distinguished by their figure, stature, and valor in combat. They were placed near the emperor, who was an eye-witness of their exploits. They served him as his bodyguards to protect and defend him. It is said that Gordian the younger first instituted them as well as the Protectors and Scholares; which articles see.

CANDIDUM, in Conchology, a species of Buccinum, described by Martini. This shell is oblong, turbinate, solid, smooth, and white. Country uncertain.

CANDIDUM, promontorium, in Ancient Geography, Botet-Abecho, a promontory of Africa, N. W. of that of Apollo; mentioned by Livy, Pliny, and Mela.

CANDIDUS, in Entomology, a species of Cerambyx, (Saperda, Fabr.) Colour white; thorax and body fuscous, with two white stripes. Fabriucus. The country of this insect is unknown.

CANDIL, in Commerce, an East Indian weight equal to 540 pounds avoirdupois.

CANDIPATNA, in Ancient Geography, a town of India, on this side of the Ganges, in the country of the Avantras, according to Ptolemy.

CANDIL, a cotton or hemp wick, loosely twisted, and covered with tallow, wax, or spermaceti, in a cylindrical figure; which, being lighted at the end, serves to illuminate a place in the absence of the sun.

The word candle comes from candela, and that from candor, of candle, I burn: whence also the middle age Greek candle.
CANDLES.

second time, then a third as before; only for the third lay they are immersed but twice, in all the rest thrice. The operation is repeated more or less times, according to the intended thickness of the candles. With the half dip they neck them; i.e., plunge them below that part of the wick where the other lays ended. Such as we have above described under be the laborious method of making common candles; but within 15 or 20 years past, when an invention was introduced which served very much to diminish the labour and to facilitate the operation. This method of making dipped candles, as now practiced by the manufacturers in London, is as follows: The wicks are prepared as above, and hung at equal distances upon the bosses; and when five or of these are filled, they are put into holes in two pieces of wood, C, D, (fig. 2); thus forming a frame full of wicks. The vessel, A, (fig. 1) is then filled with melted tallow. This vessel is made of lead, and has a hole, B, under it for receiving a shaving-dish to keep the tallow warm; and on each side of the vessel are two leaves, C, D, for catching the droppings of the candles as they are dipped; over the vessel is suspended from the ceiling a framed lever, K, K, with two arched heads, L, L, at each end, in order to give a vertical motion to the scale, I, and frame, EFH, the two crofts pieces, E, F, of which are for the leaves, C, D, of fig. 2, to rest upon. The dipper then lays hold of the upper bar at G and H, and gently pulls down the wicks into the melted tallow, and keeps them down till he finds, that by the tallow adhering to them, they are heavier than the weight in the scale I, previously adjusted to the proper weight. The frame of candles is then removed and hung up to cool, which takes some days, according to the flat of the weather. When they are quite stiff, they are dipped again with a heavier weight in the scale I, and this operation is continued, till they are of the proper size. The workman, by means of this simple contrivance, has only to guide the bosses and candles, and not to support the weight of them as in the old method.

It must be observed, that during the operation the tallow is stirred from time to time, and the stock supplied with fresh tallow. When the candles are finished, their peaked ends, or bottoms, are taken off; not with any cutting instrument, but by pulling them over a kind of flat bronze plate, heated to a proper pitch by fire underneath, which melts down as much as is requisite.

CANDLES, method of making mould. These candles are made in moulds of different materials; that generally used is pewter. Each candle has its mould, consisting of three pieces, the neck, shaft, and foot: the shaft is a hollow pewter cylinder, B, (fig. 6) having the end a somewhat smaller than the other, so that the candle may slide out easily, of the diameter and length of the candle proposed; at the extremity of this is the neck, A, which is a little metallic cavity, in form of a dome, having a moulding within, and pierced in the middle, with a hole big enough for the wick to pass through. At the other extremity is the foot, in form of a little tunnel, through which the liquid tallow runs into the mould. The neck is folded to the shaft, but the foot is moveable, being applied when the wick is to be put in, and taken off again when the candle is cold. A little beneath the place where the foot is applied to the shaft, is a kind of flaring of metal, which serves to support that part of the mould, and to prevent the shaft from entering too deep in the table to be mentioned hereafter. Lastly, in the hook of the foot, is a leaf of the same metal, folded within side, which, advancing into the centre, serves to keep up the wick; which is here hooked on, precisely in the middle of the mould. The wick is introduced into the shaft of the mould by a piece of wire, which being thrust through the aperture of the hook, till it come out at the neck; the wick is tied to it; so that in drawing it back, the wick comes along with it, leaving only enough a-top for the neck; the other end is fastened to the hook, which thus keeps it perpendicular, EE (fig. 5). Ten or fifteen of these moulds, in this condition, are laid in a frame pierced full of holes, the diameter of each being about an inch, by a screw at the top of each mould, which attaches them to the upper board B of the frame. This board has three upright sides and one sloping, which forms a small cistern for the tallow. When every mould in the frame has been provided with a wick, two wires, cc, (fig. 5) are passed through the two ends of the cistern at the top of the frame, and the loops of the several wicks. The ends of the wicks which hang out of the mould are pulled tight, their tops are put over the centers of the moulds, and the friction of the mould keeps them in this position. These moulds are filled with tallow out of a cistern, A (fig. 4.) the outside of which is wood, and lined with lead; within which is another cistern of lead for containing the melted tallow, prepared as above, with about two inches space between them all round to be filled with hot water for keeping the tallow warm. In the bottom of the vessel are three small shuttles, B, C, D, communicating with the inner vessel, and serving to fill the moulds, EE, before described. After the frame is filled and the tallow has acquired its due confluence, the two wires, cc, are withdrawn, and the loose tallow in the cistern at the top of the frame forced out; they are set out in the open air to cool, and when thoroughly cold, the candles are pulled out of the mould by a bolt pin through the loops of the wicks where the wires, cc, passed before.

Those who aim at perfection in their work, bleach or whiten their candles, by softening them on rods or broaches, and hanging them out to the dew, and earliest rays of the sun, for eight or ten days: care being taken to screen them in the day-time from the too intense heat of the sun, and in the night from rain, by waxed cloths. Tallow-chandlers make other candles, which are intended to burn during the night without the necessity of being faulched. The wick of these has been usually made of split rushes; but of late, very small cotton wicks have been substituted for the rush; these are much more easily lighted, are less liable to go out, and, on account of the smallness of the cotton wick, they do not require the aid of faulchers. The price of candles used formerly to be regulated by the masters and wardens of the tallow chandlers' company, who were accustomed to meet at their hall every month for the purpose; but now the price of every article belonging to the trade is fixed at the weekly markets.

CANDLES, wax, manner of making with the ladle. The wicks being twisted, and cut off at the proper length, a dozen of them are tied by the neck, at equal distances, round an iron circle, suspended directly over a large bason of copper tinned, and full of melted wax: a large ladle full of this wax is poured gently, by inclination, on the tops of the wicks, one after another; so that running down, the whole
whole wick is thus covered; the surplus returning into the bason, where it is kept warm by a pan of coals underneath it. They thus continue to pour on the wax, till the candle arrive at its defined size: still observing, that the three纤ile ladles be poured on at the top of the wick, the fourth at the height of \( \frac{3}{4} \), the fifth at \( \frac{4}{5} \), and the sixth at \( \frac{5}{6} \); by which means the candle arrives at its pyramidal form. The candles are then taken down hot, and laid aside of each other, in a feather-bed folded in two, to preserve their warmth, and keep the wax soft: they are then taken and rolled, one by one, on an even table, usually of walnut-tree, with a long square infusion of box, smooth at the bottom. The candle being thus rolled and smoothed, its big end is cut off, and a conical hole is made in it.

_Candles, wax, manner of making by the hand._ The wick being dipped, as in the former, they begin to soften the wax, by working it several times in hot water, contained in a bras caldron, timmed, very narrow and deep. A piece of the wax is then taken out, and dipped by little and little, around the wick, which is hung on a hook in the wall, by the extremity opposite to the neck; so that they begin with the big end, dissimulating still, as they decrease towards the neck. In other respects, the method is the same here as in the former cafe: only that they are not laid in the bed, but are rolled on the table, just as they are formed. It must be observed, however, that in the former cafe, water is always used to moisten the several instruments, to prevent the wax from flicking; and in the latter, lard, or oil of olives, for the hands, table, &c.

_Candles, wax cylindrical_, are made either with the ladle, or drawn. The first kind are made of several threads of cotton, loosely spun, and twisted together, covered with the ladle, and rolled, as the conical ones, but not pierced.

_Candles, wax, drawn_, are so called, because actually drawn, in the manner of wire, by means of two large rollers, or cylinders of wood, turned by a handle, which turning backwards and forwards several times, pa$s the wick through melted wax, contained in a bras bason; and at the same time through the holes of an instrument, like that used for drawing wire, fastened at one side of the bason: so that, by little and little, the candle acquires any bulk, at pleasure, according to the different holes of the instrument through which it pases; by this method, may four or five hundred ells at length be drawn, running. The invention of this was brought from Venice by Pierre Blef-mare of Paris, about the middle of the 17th century.

The ascent of the tallow up the wick in a burning candle, may be resolved into the same principle of filtration, or attraction, as that of water up a heap of ashes, or even up a capillary tube. The wick of a candle is but slightly twilled, that all its hairs may be easily come at; which being very small, soon take the flame: and the flame by its heat rarefyng the air, and dissipating the tallow underneath, makes the globules thereof ascend into the rarefied spaces of the wick, and thefe, with the air about it, prove food for the flame.

A patent was granted in 1799, to Mr. William Bolts of London, for new modes of improving the form, quality, and use of candles. The most material alteration in Mr. Bolts's invention from the common method of making candles, consists in having the greater part of the wick by rendering it moveable; and for this purpose it is kept constantly foaking in the tallow as it melts, so that the cotton is consumed very slowly as in lamps fed with oil. The patentee employs two methods for accomplishing this object; one is that of making candles entirely solid, without any wick passing through them; and applying the wick, which is very flart, upon the top of the solid candle, where it burns like that of a lamp; the heat which it affords when first lighted being sufficient to furnish the first supply of melted tallow, and to continue it as long as any part of the candle remains unconsumed. In order to keep the wick constantly applied, it is fastened to a small projecting spring, into which it is firmly fixed; and the surface of the candle is always kept in contact with the wick, either by causing the wick to pass round the candle like a collar, which moving freely on the candle, will sink in proportion as this is consumed, or by making the wick immovable, and putting a spiral spring at the bottom of the candlestick, which constantly protrudes the candle upwards against the wick in proportion as the tallow is consumed. His second method of constructing the candles is that of forming them in the usual shape, but with a perforation through their whole length; and the wick in this case is a small tuft of cotton, which is put into the opening at the top of the hollow candle, and to its lower part is attached a thread which pases down through the perforation to the bottom of the candle, where it penetrates the candlestick, and is wound round a key or pivot, and by turning this pivot, the wick that is attached to the upper part of the thread will be pulled down in proportion as the candle consumes. This method prevents the gathering of candles, as all the tallow that is melted is readily absorbed by the wick.

By a small variation in the form of the candle, it may be made to serve the purpose of an Argand's lamp; for which end it is compos'd of a hollow cylinder of tallow, including another cylinder also perforated; and the wick, which is of a circular form, is here placed between the inner and outer cylinders. In all these cases, the wick is compos'd of thread, placed longitudinally, and not twilled, as is the case with the common wicks, which undoubtedly afflicts the capillary attraction of the melted tallow. These wicks have also the advantage of not requiring to be snuffed, for removing the carbonaceous matter which escapes unconsumed from the tallow. Another advantage attending these detached wicks, is the case with which their bulk may be proportioned to that of the candle, and to the fulness of the material of which it is compos'd. The patentee also proposes another improvement, which is that of subjceting the melted tallow or other material to a considerable preasure, during the act of cooling; which is done by means of a condensing machine, prefeeding the surface of the liquid substance, and then giving it a greater degree of firmness and solidity when cold. The patentee has likewise described, and illustrated by a drawing, the contrivance which he has adopted for casting the hollow cylindrical candles. For a detail of other circumstances that occur in his patent, we refer to his specification in the Repertory, vol. xii. p. 368.

_Candles, laws relating to._ Every maker of candles for sale, other than wax candles, shall take out an annual licence at 11. 24 Geo. III. c. 42, 43 Geo. III. c. 69. And every person making wax or spermaceti candles shall take out a licence at 1l., and for dealing in, or selling such candles shall pay 10s. 6d., and renew the same annually, under a penalty of 20l. 24 Geo. III. c. 36, 43 Geo. III. c. 69. But no person who hath paid such licence duty for making, shall be obliged to take out a licence for selling also, during the same year. 24 Geo. III. c. 41. By 24 Geo. III. c. 74, no person, residing within the limits of the head-office, shall be permitted to make candles, unless he occupy a tenement of 10l. a year, affixed in his own name, and for which he pays the parish rates; and elsewhere, unless he be affixed and pay to church and poor. By 43 Geo. III. c. 69, in lieu of any fulfilling duties of excise, the following duties are imposed; viz. for every pound avoirdupois of candles, except those of wax.
CANDLES.

Wax and spermaceti, made in Great Britain, 1d.; and for every pound of wax or spermaceti candles so made, 3/-.

All places for making or keeping of candles, and of materials for the same, and furnaces, moulds, &c. for melting such materials, are forbidden to be used without notice previously given in writing at the next office of excise, under a penalty of 50l., and forfeiture of all candles and materials, furnace, &c. which have not been entered, 8 Ann. c. 7.

And by 11 Geo. c. 30, makers of candles who make use of such places or utensils without entry incur a forfeiture of 100l.

Officers shall be permitted, at all times by day, and also in the night with a constable, to enter the house, melting-house, &c. of a maker of candles, and to take an account of the quantity, when all chafes, &c. shall be opened; and the penalty of obstructing or molesting such officer is 100l.; or if candles, &c. be found in unenterted places, the offender shall be convicted in the penalty of 100l. 11 Geo. c. 31; see also 24 Geo. III. c. 11, and 27 Geo. III. c. 31.

Any maker of candles shall give notice in writing to the proper officer of his intention to begin a course of dipping and preparing for the same, with a declaration of the time when he intends to commence his operation, and a specification of the number of sticks, moulds, &c. which he proposes to use, under a penalty of 50l. 10 Ann. c. 26. 11 Geo. c. 30. 24 Geo. III. c. 11. Such notice shall be given, within the limits of the head-office, 6 hours, within any city or market town, 12 hours, and elsewhere 24 hours, before he shall begin, on pain of forfeiting 50l. 25 Geo. III. c. 74.

If he does not begin and proceed at the time mentioned, or within 3 hours next after such notice shall be void. Having begun, he shall continue working without interruption, till the whole course is finished, on pain of forfeiting 20l. 26 Geo. III. c. 77.

Every candle maker shall provide sufficient locks and fastenings to every furnace, copper, mould, &c. to be secured by the officer, when they are not used; and he shall give notice in writing to the said officer, 6 hours before the time when he wishes to use them, within the limits of the chief office, 12 hours in any market town, and 24 hours elsewhere; any offence against the provisions of this act inures a penalty of 100l. 27 Geo. III. c. 31.

The officer shall charge for materials that are misfiling, after he has taken account of the same; and obstruction incurs a forfeiture of 20l. Candles that are spoilt in making shall be defaced by the officer, and he shall make allowance for the duty. No maker of candles shall, on pain of 20l., remove candles before they are surveyed; and those that have not been surveyed are to be kept separate from the others, on pain of 5l. 8 Ann. c. 9.

On suspicion, that candles are privately made, or concealed to evade the duty, the ground of which has been flatted on oath before two commissioners or one justice residing near the place, the officer may be empowered by special warrant, granted by such justices or commissioners, to enter the place suspected, and to seize as forfeited all candles that are found, and all materials for making them; and the person so offending, or obstructing the officer, shall forfeit 100l. 5 Geo. III. c. 43. 27 Geo. II. c. 24. If any candle-maker shall mingle candles not weighed by the officer with those that have been weighed, or remove any before weighing, or conceal any candles or materials, he shall forfeit 100l. 11 Geo. c. 31.

Any person who is found afflicting in privately making candles shall forfeit 20l.; and every person making candles shall once in every week enter the same in writing at the next excise-office, with their weight, number, &c. and quantity; on pain for every neglect of entry to forfeit 20l.; and in one week, after entry, he shall clear off the duties, on pain of double duty, nor shall he carry out candles till the duty hath been paid, on pain of double value.

25 Geo. III. c. 74. Persons buying, receiving, or having in their possession candles, not charged with the duty, shall forfeit the same, and treble value. 25 Geo. III. c. 77.

Nor shall any person expose to sale any candles, unless in his public shop or warehouse, public fair or market, on pain of 5l. 8 Ann. c. 9. No candles shall be imported, otherwise than in some package containing at least 22lb. of neat candles, on pain of being forfeited and forfeiting, and the master of the vessel shall forfeit 50l. 25 Geo. II. c. 21. 42 Geo. II. c. 93.

And no candles imported other-wise than according to 23 Geo. II. c. 21, shall be entered for exportation. 42 Geo. III. c. 93. All wax candles feized on importation or otherwise, and condemned for non-payment of the duties, shall be rendered unfit for use, 23 Geo. III. c. 36.

Candles for which the duty hath been paid may be exported, with a draw-back of the duty, 8 Ann. c. 9. 43 Geo. III. c. 69. If any maker of candles shall obstruct any officer in the execution of the powers given him by any act for securing the duties on candles, he shall for every such offence forfeit 100l. 24 Geo. III. c. 11.

Every maker shall keep full scales and weights, and permit and afford the officer in the use of them, on pain of 10l. 8 Ann. c. 9; and if he use scales and weights that are insufficient, he shall forfeit 100l. 10 Geo. III. c. 44; and by 28 Geo. III. c. 37, the same shall be forfeited, and may be seized by any officer of excise. Obstruction of the officer in weighing or the hindrance of his taking a full account of stock, subjects to a forfeiture of 100l. 26 Geo. III. c. 77.

CANDLES. Observations on the manufacture, comparative value, and use of different. The Roman candles were at first little strings dipped in pitch, or surrounded with wax; though afterwards they made them of the papyrus, covered likewise with wax; and sometimes also of rushes, by stripping off the outer rind, and only retaining the pith. For religious offices, wax candles were used; for vulgar uses, those of tallow. Serv. ad. Æn. i. lib. v. 731. Phil. Nat. Hist. i. xviii. c. 37. Lord Bacon propounds candles of divers compositions and ingredients, and also of different sorts of wicks; with experiments on the degrees of duration, and light of each. Good housewives are said to bury their candles in flour or bran, which, it is said, increases their durability, almost one half. Some speak of perpetual candles made of Salamander wood. Bac. Nat. Hist. Cent. 4. c. 369, and Cent. 8. c. 744.

The two substances most commonly used in the manufacture of candles are wax and tallow. Wax owes its whiteness, and the greater facility it acquires, to an absorption of the vital part of the atmosphere; and in this circumstance it seems principally to differ from tallow, or concrete oil. But as wax is already combined with a portion of vital air or oxygen, it does not burn with so luminous a flame as tallow oil. But it possesses a very great advantage in the fabrication of candles, arising from its freezing point being placed at a considerably higher temperature than that of the other substance. Tallow melts at the 52d. degree of Fahrenheit's thermometer; spermaceti at the 133d. degree; and bleached wax at 155°. Hence it will not be difficult to explain the chief advantage of wax candles compared with those of tallow. Oils, it should be considered, do not take fire, unless they be previously volatilized by heat; and this is effected by means of the wick of a candle, or lamp. The oil rises between the fibres of the wick by the capillary attraction. Heat, being applied to the extremity of the wick, volatilizes and sets fire to a portion of the oil. While this is dissipated by combustion, another portion passes along the fibres, or supplies its place by becoming heated and burned likewise. In this way a constant combustion is maintained. A candle, however,
C A N D L E S.

ever, differs from a lamp in one very essential circumstance; viz., that the oil, or tallow, is liquefied only as it comes to be in the vicinity of the combustion; and this fluid is retained in the hollow of the part, which is still concrete, and forms a kind of cup. The wick, therefore, should not, on this account, be too thin; because if it were, the candle, it would not carry off the fluid as fast as it becomes fused; and the confinement would be, that it would run down the sides of the candle; and as this inconvenience arises from the fusibility of the oil, it is plain that a more fusible candle will require a larger wick; or that the wick of a wax candle may be made thinner than that of one of tallow. The flame of a tallow candle will of course be yellow, smoky, and obscure, except for a short time after wicking. When a candle with a thick wick is first lighted, and the wick snuffed short, the flame is perfect and luminous, unless its diameter be very great; in which last case, there is an opaque part in the middle, where the combustion is impeded for want of air. As the wick becomes longer, the internal between its upper extremity, and the apex of the flame is diminished; and consequently the oil, which much furnishes light, is burnt at a greater speed of ignition to pass through, leaving completely burned, and puffs off partly in smoke. This evil increases, until at length the upper extremity of the wick projects beyond the flame and forms a support for an accumulation of foot which is afforded by the imperfect combustion, and which retains its figure, until, by the descent of the flame, the external air can have access to the upper extremity. But in this case, the requisite combustion which must snuff it, is not effected; for the portion of oil emitted by the long wick is not only too large to be perfectly burned, but also carries off much of the heat of the flame, while it assumes the elastic state. By this diminished combustion, and increased efflux of half-decomposed oil, a portion of coal or dust is deposited on the upper part of the wick, which gradually accumulates, and at length affumes the appearance of a fungus. The candle does not then give more than one-tenth of the light which the due combustion of its materials would produce; and, on this account, tallow candles require continued snuffing. But if we direct our attention to a wax candle, we find that as its wick lengthens, the light indeed becomes less. The wick, however, being thin and flexible, does not long occupy its place in the centre of the flame; neither does it, even in that situation, enlarge the diameter of the flame, so as to prevent the access of air to its internal part. When its length is too great for the vertical position, it bends on one side; and its extremity, coming in contact with air, is burned to ashes; excepting such a portion as is defended by the continual efflux of melted wax, which is volatilized, and completely burned, by the surrounding flame. Hence it appears, that the difficult fusibility of wax renders it practicable to burn a large quantity of fluid by means of a small wick; and that this small wick, by turning on one side in consequence of its flexibility, performs the operation of snuffing upon itself, in a much more accurate manner than it can ever be performed mechanically. From the above statement it appears, that the important object to society of rendering tallow candles equal to those of wax, does not at all depend on the combusibility of the respective materials, but upon a mechanical advantage in the cup, which is afforded by the interior degree of fusibility in the wax: and that, in order to obtain this valuable object, one of the following effects must be produced: either the tallow must be burned in a lamp, to avoid the gradual progression of the flame along the wick; or some means must be devised to enable the candle to snuff itself, as the wax candle does; or the tallow itself must be rendered less fusible by some chemical procures. With a view to the last of these objects, a cylindrical piece of tallow was inserted into a metallic tube, the upper aperture of which was partly closed by a ring, and the central part occupied by a metallic piece merely reflecting that part of the common lamp which carried the wick. This piece was provided with a short wick. The cylinder of tallow was supported beneath in such a manner that the metallic tube and other part of this lamp were left to hold with their whole weight upon the tallow at the ring or contraction of the upper aperture. In this situation the lamp was lighted, and it burned for a considerable time with a bright clean flame, more uniformly intense than that of a candle, and superior to the ordinary flame of a lamp in its colour and the perfect absence of soot. After some minutes it began to decay, and soon afterwards went out. Upon examination it was found, that the metallic piece which covered the wick had sufficed a sufficient quantity of tallow for the supply during the combustion; that part of this tallow had flowed beneath the ring, and to other remote parts of the apparatus, beyond the influence of the flame; in consequence of which, the tube and the cylinder of tallow were filled together, and the expected progression of suflower prevented. In every lamp for burning candle oil, it seems probable, says Mr. Nicholison (ubri infra) that the materials ought to be so disposed as to descend to the flame upon the principle of the fountain reservoir. Although this construction failed, a contrivance of a similar nature would be of very great public utility. With regard to the second object above specified, Mr. Nicholison is led by various considerations to imagine, that the spontaneous snuffing of candles made of tallow or other fusible materials, will scarcely be effected but by the discovery of some material for the wick, which shall be voluminous enough to absorb the tallow, and at the same time sufficiently flexible to bend on one side. The most promising speculation respecting this most useful article, seems to regard the cup which contains the melted tallow. This is apt to break down by fusion, and thus to suffer its fluid contents to escape. The Chinese have a kind of candle about half an inch in diameter, which, in the harbour of Canton, is called a "lobshock." The wick is of cotton, wrapped round a small stick or match of the bamboo cane. The body of the candle is white tallow; but the external part to the thickness of about one-thirtieth of an inch consists of a waxy matter coloured red; this covering gives a considerable degree of fusibility to the candle and prevents its guttering, because it is less fusible than the tallow itself. The wick in the middle might probably be of advantage in throwing up a little carbon in the flame than would have been conveyed by a wick of cotton sufficiently stout to have occupied its place unsupported in the axis of the candle. Mr. Nicholison says that he formerly made a candle in imitation of the "lobshock." For this purpose he adapted the wick in the usual pewter mould; he then poured in wax, which was immediately afterwards poured out; the film of wax, adhering to the inner surface of the mould, soon became cool; and the candle was completed by filling the mould with tallow. When it was drawn out, it was found to be cracked longitudinally on its surface, which it attributed to the contraction of the wax, by cooling, being greater than that of the tallow; or it might have been owing to the too sudden cooling of the wax before the tallow was poured in. The experiment was not repeated. After all, the most decisive remedy for the imperfection of this chesepet, and in other respects best material for candles, would undoubtedly be a diminution of its fusibility: with this view Mr. Nicholison made some experiments. The object is, in a commercial view, entitled to affectionate and extensive investigation. Chlorides in general, supposing the hardness or less fusibility of wax to arise from oxygen
The Chincote obtain from the tallow tree (Crotton foliiforum, Linn.) a kind of vegetable fat, with which they make a considerable proportion of their candles; which are firmer than those of tallow, and free from all offensive odour; but they are not equal to those of wax, or spermacetia. Cheap candles are also made of tallow, and even of grease of too little consistence to be used, without the contrivance of being coated with the finer substance of the tallow tree or of wax. The surface of these candles is sometimes painted red. Their wicks are made of different materials. For their lamps, they use the amianthus, which burns without being consumable in fire, or the artemisia, and cardus marcus, with which tinder is also made; but for candles, they use a light inflammable wood, in the lower extremity of which is pierced a small tube to receive an iron pin, which is fixed on the flat top of the candlestick, and thus supports the candle, without the necessity of a socket. The candle-makers at Munich have for several years past prepared tallow candles with wooden wicks, which afford about the fame quantity of light as a wax candle, burn also with great steadiness and uniformity, and never crack or run. These wicks are formed of very thin slips of wood, bound round to a considerable thickness with very fine spun cotton, but such that the size of the wick does not much exceed that of the wick of a common candle. The candle-makers either purchase or prepare for themselves these slips of wood, which are somewhat square and not completely rounded, and are made of pine, willow, and other kinds of wood, but more commonly of fir. Some take shoots of the pine-tree a year old, or common fir twigs of the same age, scrape off the bark, and reduce them to the size of a small straw; they then rub over these rods with wax or tallow, till they are covered with a thin coating of either of these substances; after which they roll them on a smooth table in a very fine carded cotton, drawn out to about the length of the rod or candle-mould. After this preparation the wick will have acquired the size of the barrel of a small quill; and the more accurately the size of the wick is adapted to that of the candle-mould, so much the clearer and longer will the candle burn. These wicks are then placed very exactly in the middle of the mould, and retained in that position; and good fresh tallow, previously melted with a little water, is then poured round them; but old and rancid tallow will not run if the wicks be properly made. These candles not only burn longer than the common ones, but they do not flare, and they are less prejudicial to the eyes of those who are accustomed to read or write at night. They must be infused with a pair of sharp scissors, and in doing this care must be taken not to damage or break the wick.

It has been suggested by Dr. Franklin, that the flame of two candles joined gives a much stronger light than both of them separate. Probably the union of the two flames produces a greater degree of heat, by which the vapour is attenuated, and the particles of which light consists more copiously emitted. Priestley’s Hist. of Vision, &c. p. 807. For a comparison of the light of a candle with that of a lamp, see Lamp. For the method of estimating the intensity of candle-light, &c. see Light and Photometer.

Dr. Ingenhousz has described in the Philosophical Transactions (vol. 68.) a method of lighting a candle by a small electrical spark. For this purpose he uses a small phial, having 8 to 10 inches of metallic coating, or even less, charged with electricity; and the operation may be performed at any time of the night by a person, who has an electrical machine in his room. “When I have occasion to light a candle,” says he, “I charge a small coated phial, whose knob is bent downwards, so as to hang a little over the body of the phial; then I wrap some loose cotton over the extremity of a long brass pin or a wire, so as to stick moderately fast to its substance. I next roll this extremity of the pin wrapped up with cotton into fine powders of resin, which I always keep in readiness upon the table for this purpose, either in a wide-mouthed phial or in a loose powder; this being done, I apply the extremity of the pin or wire to the external coating of the charged phial, and bring as quickly as possible the other extremity wrapped round with cotton to the knob; the powder of resin takes fire and communicates its flame to the cotton, and both together burn long enough to light a candle. As I do not want more than half a minute to light my candle in this way, I find it a readier method than kindling it by a flint and steel, or calling a venter. I have found, that powder of white or yellow resin lights easier than that of brown. The “farina lycopodi” may be used for the same purpose; but it is not so good as the powder of resin, because it does not take fire quite so readily, requiring a stronger spark not to miss; besides, it is soon burnt away. By dipping the cotton in oil of turpentine, the flame effect may be as readily obtained, if you take a jar somewhat greater in size. This oil will inflame so much the reader if you draw a few fine particles of brafs upon it. The pin dull is the bell for this purpose; but as this oil is scattered about by the explosion, and when kindled fills the room with much more smoke than the powder of resin, I prefer the last.”

For the method of lighting candles by phosphoric tapers or matches, see Phosphorus.

Candle, a term sometimes used in Medicine and Surgery. Thus, medicinal candles, candela feminales, are compositions of odoriferous, aromatic, and inflammable matters, as benzoin, floroxan, olibanum, turpentine, and the like, mixed up with a third or more of the charcoal of willow or lime-tree, reduced to a proper consistence with mucilage of tragacanth, and formed into masses in shape of candles. The effusus and odours of these candles, when burnt, are supposed to be salutary to the breath, &c. For candles in surgery; see Bougie.

Candle, corpi, canus, corpis, in Welsh, a name given to a light or flame, resembling that of a candle, which, according to an opinion very commonly received in the diocese of St. David’s in South Wales, proceeds from the house, and even sometimes from the bed, where a sick person lies a short time before his death, and pursues its way to the church where the corpse is to be interred, precisely in the same track which the corpse is afterwards to follow.

Candle, fade or aflaion by inch of. See Inch of Candle. There is also a kind of excommunication by inch of candle; wherein the time a lighted candle continues burning is allowed the sinner to come to repentance; but after which he remains excommunicated to all intents and purposes.

Candleberry tree, in Botany, see Myrica Cerifera. For the wax of this tree, see Wax.

Candle bombs, denote small glass bubbles, with a neck of slender bore about an inch long, through which a small quantity of water is introduced, and the orifice is then closed up. When this flask is applied to the wick of a burning candle, the flame soon rarefies the water into steam, the elasticity of which breaks the glass with a loud explosion.

Candle, philosophical, or candle of the chemists, as it is sometimes called, consists of a bladder having its orifice furnished with a tube of metal some inches in length, and capable of being adapted to the neck of a bottle, containing a composition formed in the proportion of 3 ounces of oil or spirit of vitriol, and 12 ounces of common water, to which, when
CANDLES, rubb. are made of the pith of a fort of mihes, peeled or flipped of the skin, except on one side, and dipped in melted grane. These are used among the poor in some parts of Great Britain.

Candlewood, slips of pine about the thickness of the finger used in New England, and other colonies, to burn instead of candles, giving a very good light.

The French inhabitants of the island of Tortuga use slips of yellow funal wood for the same purpose, and under the same denomination of bois de chandelle, which yields a clear flame, though of a green colour. The nations of Othakitee use, as a substitute for candles, the kernels of an oily nut annexed, one above another, to a skewer that passeth through them; the nuts answer the purpose of tallow, and the skewer that of a wick.

CANDLEMAS, a feast of the church, held on the 2d of February, in memory of the Purification of the Blessed Virgin. It takes its name either from the number of lighted candles used by the Romish church, in the processions of this day; or because, before maids, the church consecrated candles for the whole year. This ceremony was prohibited in England, by an order of the council in 1548.

Candlemas is also called, in ancient writers, Hypapante; and among the moderns, the Purification.

Some will have this feast to have been instituted by pope Gelasius, in lieu of the heathen Lupercalia; and that procession was thereon made with lighted candles round the fields and grounds, by way of exorcism. Hence Bede says, it is happy for the church to have changed the habitations of the heathens, held in the month of February, around the fall of the procession with hallowed candles, in remembrance of that divine light whereby Christ illuminateth the world, whereas he was stydol by Simeon, a light to lighten the Gentiles. Others ascribe the origin of candles to pope Vigilius, in the year 536, and suppute it instituted for the feast of Proserpine, held with burning tapers by the heathens in the beginning of February. In Scotland, candlemas is one of the four terms of the year. See Term.

In England, this is no day in court, for the judges do not sit; and it is the grand day in that term of all the ins of court, in which the judges anciently observed many ceremonies, and the socities seemed to vie with each other in sumptuous entertainments, accompanied with music and all kinds of diversions.

Candlemas lies, in Geography, two islands in the South Pacific Ocean, discovered by captain Cook in 1775. S. lat. 57° 10'. W. long. 27° 13'.

Candlemas Shows lie about 2° of latitude due N. of Port Prinfin (which see), and were discovered, named, and mapped by Mendana, in 1568.

Candlestick, a household utensil, contrived to hold one or more lighted candles. Larger and more stately candlesticks, contrived for holding a great number of candles, are called branches, and girandoles; and when made of brass, lusters.

In the year 1800, Mr. Raybould, of London, obtained a patent for candelllicks on a new principle, which will also and firmly hold candles of various sizes. The candelllick of his invention is a hollow paper of metal or brass; the candle is fixed into a socket composed of a broad circular base, formed of two half cylinders cut down perpendicularly, and fixed in the same fland, so as to form a complete candle when joined together. Their approach to each other is regulated by a screw, so that they may be placed upon a candle of any size, and will hold it firmly. This candle slides up and down the candlestick by means of a small knob which is fixed to the socket containing the candle, and projects on the outside through a longitudinal slit in the candlestick from the top to the bottom. The candle socket is kept up to any height by a spring which projects from its lower part, and presses on the outside of the hollow pillar, which forms the rim of the candlestick. Fig. 7 Plate of Candlesticks, represents one of Mr. Eardall's patent candlesticks; it is calculated to let the candle at any height as it is consumed, to accomplish this the upper part A slides into that of B, and the part B slides up and down in that of C. In order that these slides may keep in the place they are fastened with 4 screws, fig. 7, unscrewed, and is represented separately in fig. 8.

To the bottom of the rim is soldered a copper cylinder, which goes with inside of the tube c; in three or four places on this cylinder an oblong piece of the metal E is cut out, except at the upper end; it is then bent inwards, to give it a sufficient spring against the sliders A, B, to ready it: this contrivance is the same as is used in sliding telescope tubes. Figs. 9, 10, 11, and 12, represent different contrivances for making the nozzle of the candlestick fit different fixed candles; in fig. 9, the two leaves A, B, which compose the nozzle, are fixed to the part c, as to have a tendency to spring from each other; but they can be brought together to fit the candle, by sliding the ring D upwards. In fig. 10, the two pieces of iron plate A, B, are inclosed in a common vessel, and are riveted to it at c; they may be closhed by the screw D, and their own elasticity opens them when the screw is slackened. In fig. 11, the size of the nozzle A is diminished by three segments of a circle a b, and another not seen, which, when the rim B, on the outside, is turned one way, they move into, and diminish the size of the nozzle A; but when it is turned the other, they draw back flush with the inside of the tube E. This is effected by the mechanism, represented in fig. 12, where A, B, C, C, are the segments moving on centres; on the inside of the rim B, C, are three knobs b, b, b, which, when they are moved round one way, press on the projections a, b, c, on the long end of the segments, and move the n into the cavity A; but when turned the other, they press on the knobs on the short end of the segments, and draw them back.

The golden candlestick was the richest utensil in the Jewish tabernacle. It was made of solid gold, and weighted a talent; and, according to Cumberland, the value of it, exclusive of the workmanship, was 5770 pounds. It contained seven lights, six branching out in three parts on each side of the upright stem, and one on the top of it. Each branch was adorned with cups, knobs, and flowers, alternate and equidistant; and on the top of each was fixed a lamp, in form of an almond, which might be put on or taken off occasionally; and in these were put the oil and the wick, or the cotton, which was drawn in and out by tongs or pliers; under them were flnudflicks for receiving the sparks, or refuse of the oil that fell from the lamps. This candlestick was placed in the antichamber of the temple, on the south side, and served to illuminate the altar of incense, and the tabernacle of the shew-bread; and it was the burden of the priest to light the lamps every evening, at the time of incense, and to extinguish them at the same time.
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CANDY, a very confiderable province in the ifland of
Ceylon, fituate in the centre of the ifla id, and formerly honoured with the royal refidence. The king ft 111 holds his
and though, all the other provinces have been
court there
more or lefs encroached upon, no part of Candia has ever
been reduced to permanent fubjeftion under a foreign power.
The European dominions, however, which lie towards the
coaft, completely encircle the territories of the king of Candy,
a cape of the ifland

A

:

that occupy the greater part of the interior of the ifland.
But iince the Candians have been driven by their invaders
into the mountains of the interior, it has been their policy
carefully to prevent any European from feeing thofe obj

from
by winch an army could penetrate
European by any accident was

avarice of his countrymen, or

which might tempt the

obferving the approaches
If an
their mountains.

carried into their territories, they took

every precaution to
prevent him from efcaping ; and the guards Rationed every
where at the approaches, as well as the wide and pathlefs
woods which feparate the interior from the coaft, rendered
The domifuch an attempt almoft completely defperate.
nions of the native prince are cut off on all lides from thofe
occupied by the Europeans, by almod impenetrable woods

and mountains.

The

pafles

which lead through thefe to

the coafts are extremely fteep and difficult, and fcarcely
known even to the natives themfelves. Beyond the woods
and mountains the country prefents a fcene widely differing
in foil, climate, and appearance from that which lies within
10 or 2D miles from the fea-coaft ; and it feems to have advanced but a few fteps beyond the fir ft ftate of improvement,
when compared with the highly cultivated fields, not far
The country gradually
diftant, which furround Columbo.
ifland,
and the woods and
of
the
rife« toward the centre

mountains that feparate

its feveral

parts

become

more, fteep

-

they could have accefs to foreign nations, and an opportunity
of importing either arts or manners into their own.
In the
northern part of the kingdom "lies the province of Nourc
Calava, where may ftill be difcovered the ruins of the once
famous and fplendid city of Anurodgburro ; ftanding almoO:
at the northern extremity of the Candian dominions, and
In former ages
bordering on the province of Jafnapatam.
this w s the refidence of the kings of Ceylon, and has for a
Tradition reports,
long time been the place of their burial.
that they reigned in regular fucceffion for 90 generations of
the fame family, from the time of the flood, and that they
lived to a great age, like the ancient patriarchs.

After their

death they are fuppofed to have been carried up to heaven,
and to ha\t been fince employed as tutelary deities to the
They were revered as deities, and
inhabitants of the ifland.
all buried in a large temple, or tomb, near their ancient city
of Anurodgburro, the remaining veftiges of which indicate
an uncommonly excellent architecture for the age in which it
was erected. In the vicinity of this town flood formerly the
ftately temples and pagodas of the Ceylonefe worfhip, as appears by the mafly pillars and hewn ftones which ftill remain*
The Portuguefe, when they became mailers of the town, facrilegioufly deitroyed its religious edifices, and tranfported
the choiceft materials to fortify Columbo and the other
towns which they erecled on the fea-coa'ls ; an aft which
The whole of the
the Ceylonefe ftill record with horror.
king's country, the plains around Anurodgburro excepted,
prefent a conftant interchange of fteep mountains and low
The excefiive thicknefs of the woods, that cover
vallies.
the greateft part of the country, occafions heavy fogs and
unwholefome damps. The vallies are generally marfhy, and

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4

abounding


CANDY.

ubomunding with springs, which excellently adapt them to the cultivation of rice and the rearing of cattle. The humidity of the climate, after the rainy season, counteracts these advantages. The principal difference between the climate of the interior and that of the coast is occasioned by the flagrant of the atmosphere in the former. The depth of the valleys and the thickness of the woods concur in preventing the free circulation of the air; so that the night is constantly attended with very cold damp, which are succeeded by days equally anxious on account of their hot and sultry vapours. Hence it happens, that an European on coming to the interior is very subject to the chill or scuffle fever; a disease resembling our ague and intermittent fever, accompanied with a violent dyshyentery, which never leaves the person attacked till he removes to the sea-coast, where the climate is more cool and refreshing in the day, and more free from the cold and damp of the night. The country of Candy can never derive any improvement from internal navigation; as the several large rivers that intersect it are renders, during the rainy season, so rapid and impetuous by the torrents which fall into them from the surrounding hills, that no boat can venture upon them, while in the opposite they are almost completely dried up. Its largest rivers are the Mahawonu and Mahondu, which feed. The rainy season varies in different parts of the interior. The S.W. quarter is subject to the influence of the equinoctial monsoons, while the N.E. is but slightly touched by those from the opposite quarter. The high range of mountains that enrols the country of Candy divides the island into two different climates; so that there has been a continued drought on one side of them for years, while it has rained on the other without intermission. The eastern parts are less subject to the influence of the monsoons than those to the west, and consequently much less drenched with rains. Among the mountains of the interior, the feasons do not exactly correspond to either of the monsoons; and among them it rains incessantly in March and April, at which period it is dry in the low lands.

The disposition and character of the Canadins derive their call from their situation. Although they are subject to complete despotism, they are proud of being free from a foreign yoke, and of being the slaves only of their own race. They are in their air and affect grave and learned, and regard with contempt the Cingalese in their servility, as a mean despicable race, who better their natural rights for peace and protection. Nevertheless, they are more cautious and polite, and at the same time more crafty and treacherous than their countrymen of the low-lands.

They are also more athletic, and being accustomed from their infancy to bear arms, and to watch the different posts where danger is apprehended, they acquire a military air, which distinguishes them from the Cingalese. Their horses are also neater and better built. The dress of the higher order of the Canadins consists of several folds of cotton cloth, or calico, drawn close round their waist; while another piece, after being wrapped round the body, is tucked up at the back by one end, and by the other drawn together between the legs, or hanging down straight to the ankles; their arms, shoulders, and chest are bare. On their heads they wear a hat of straw, broad and flat at the top, narrow towards the lower part, and covered with "cojoes," a species of leaf-like mane of rice. Over their shoulder, or round their waist, they wear a belt, to which a dagger or short hanger is frequently added. Between them they wear a cap, which holds batik, odalas, and tobacco; and they are commonly attended by a boy, with an ivory or tortoiseshell box filled with these articles. They constantly use an umbrella of talipot-leaf when they walk abroad in the day.

They all wear rings on their fingers; some are polished by royal and petty from among them in trade. The chief distinction, with regard to dress, between the ruler of the Canadins and the Cingalese, consists in the form of the cap, and the manner of their dress. So that the want of the former. The dress of the latter is in only much more elaborate than the Cingalese. The Canadins are more in respect to the countrymen and women.

The women are generally dressed in the same manner as the men, with the exception of the head-dress, which is much more elaborate. The Canadins are distributed into different classes, according to their respective professions. The high cast comprehends the nobles, who never communicate their blood by intermarriage with persons of inferior rank. This class is known by the name of "Hindustani." The next rank includes all, as painters, sculptors, carpenters, and goldsmiths. Their dress is the same with that of the Hindustani, but they are not permitted to eat with the nobles, or to mix in their society. Those who are employed in the lower occupations, as they are dressers, or barbers, potters, weavers, etc., form a third cast, with which the common labourer ranks. The fourth cast includes the peasants and labourers of all descriptions, who either cultivate the land for themselves, or are forced to work for others. All these four casts continue unmixed; the son pursuing the profession of his father from generation to generation. Besides these castes, there is in Canadins, as well as in other parts of India, another wretched cast, called the "scavengers," who by any crime or neglect of superflitious rites have, according to the decree of the priests, forfeited their cast, and are condemned to infamy, pertaining to themselves, and entailed on their descendants through all generations. None of any other cast will intermarry with them; they are not allowed to exercise any trade or profession, nor to hold intercourse but with such as themselves; and if they accidentally touch any thing, it is reckoned polluted and accursed. Not allowed to work, they are reduced to the necessity of begging for their subsistence. These unhappy people are obliged to pay the heaviest of the Canadins as much reverence as common suffrage ordains the latter to pay to their sovereign.

The government of Candy is an absolute despotism, and resistance to the will of the king is attended with certain and immediate destruction. Nevertheless, the Canadins hold in veneration fundamental laws of remote antiquity, the violation of which renders the sovereign amenable to the justice of his country as well as the meanest subject. By these fundamental laws the monarchy is elective, and the people may sit aside the next branch of the royal family, and elect the more distant, or even a stranger; though the throne has been in general, for many ages, possessed by the ancient Canadin royal family, which is now very nearly extinct. The king of Canadins yields no eastern prince in the number and extravagance of his titles, which it is needless to recount. They claim, however, from his subjects corresponding reverence. No one dares approach him without professing himself three times before the throne, and at each act of prostration repeating his titles. Persons of the highest rank are prohibited from coughing or spitting in his presence, and every one must abstain before him avoidable sneeze. For profanity, however, is always attended by a number of punishments on inferior instruments, such as tom-toms, or drums of various sorts, still and trumpets, clarinets, pipes, flageolets, a sort of bag-pipes, and pieces of brahs and iron jangled by way of triangles. Among
other attendants of the monarch are people furnished with long whips, made of hemp, cords, graps, or hair, with a thong or lash 8 or 12 feet in length, without any handle; and whose business it is to run before the procession with strange gestures, in order to clear the way, and to announce his majesty's approach. As the government is despotic, all forts of promotion depend on the king's pleasure; nevertheless, respect is uniformly manifested to the authority of chiefs, and officers of a certain rank must always be charged of a certain class. The king's regular troops, or standing army, are always near his person, and do duty in the interior; while the defence of the frontiers is entrusted to the adjoining inhabitants, who form a sort of militia, and watch over the entrances into the country. The high-cit officers of the state are the "Adigar," or prime ministers, two in number, who share the whole power of the court. These are usually selected from opposite factions, and of different dispositions, to prevent an union which might overthrow the royal power. The adigars are the supreme judges of the realm; before them all causes are brought, and they pronounce final judgment; though from their sentence an appeal, seldom of any avail, lies to the king himself. The distinguishing badge of the adigars consists of a certain number of officers, who compose their train, and who carry a fort of flames, and a feal of hard clay, indicating the king's commission, and never permitting it to come to the knowledge of the command. The embassies to the European government at Caloumba are entreated to the prime minister; and they are also charged with the reception of our ambassadors. Next in rank to the adigars are the "Difuaus," who are the governors of the "cortels," or districts, and also the principal military commanders; they attend the king's peron, collect the revenues, and maintain order and discipline. But though they possess great authority, as well as the other officers of state, none of them are allowed to punish capitally without the cognizance of the king, whose exclusive prerogative it is to pronounce sentence of death. The difuaus, while they retain their office, are allowed by the king a certain portion of land for their services; but under pretence of collecting contributions for their royal master, they are chargeable with grievous oppression. Subordinate to these inferior officers resident in the several districts in which they are appointed, as their superiors generally reside at court and attend the peron of the king. To these again there is another inferior rank of officers, who are employed in the collection of the taxes of confiables and other offices. The whole plan of government forms a regular system of opprobrium, which is severely felt by the lower orders of the people, whose property is wholly at the mercy of the rapacious officers of the court.

The principal revenues of the king arise from presents or contributions brought him by the people, or rather irregularly enforced by his officers, two or three times a year. These contributions consist of money, precious stones, ivory, cloth, corn, fruit, honey, wax, arms, and other articles of their own manufacture, as spears, arrows, pikes, targets, talitop-leaves, &c. The oppression principally experienced by the lower classes of the people is also extended to persons of superior rank. On certain festivals observed in great state, all the "Mahondrews" and principal people are required to attend, and none must approach the royal presence empty-handed. After deposition their presents at the palace-gate they are admitted into the presence of the king, and received according to the value of their offering. Besides these stated modes of extortion, there are others less oppressive. Any person who is known to possess any articles of value is required to impart a portion to the royal treasury; and artills are frequently employed by the king to manufacture for him arms and different articles in silver and gold, altogether at their own expense. All the Canadians are obliged to take arms without diminution at the command of the sovereign. His regular troops, as they are called, may consist of about 15,000 men. Like other despots who are afraid to trust their own subjects, the king always keeps about his person a body of Malabars, Malays, and others, who are not his own natural subjects. In these he reposes his chief confidence, and he employs them as his constant body-guard. Before this corps of foreign guards, who do perpetual duty at the royal palace, about 8,000 of his regular troops and a number of the nobles are quartered in the neighbourhood, ready to be assembled at a moment's notice. The rest of the military force lives scattered through the country. Their pay and subsistence consist of a small allowance of rice and salt, a piece of cloth annually given for their drees, and an exemption from taxes and all other services, and a small piece of ground on which they cultivate for themselves. The usual military punishment is compulsion to level a piece of hill, or clear the channel of a river. For more trivial offence the folders are curtailed of their pay and allowances. Draught and jealousy, the constant attend-ants of arbitrary power, pervade the whole military body-guard. Officers are encourag'd by the king to act as spies against each other, and they are expected to inform whenever possible of each other's movements and secrets, and to prevent them, except at times when public exigency requires it, by being assembled. They are chiefly prevented from forming any intercourse or combination with Europeans; and for this purpose a continued chain of posts and watch-towers is established around all the outskirts of his dominions. This system of vigilance is so strictly observed, that no one is permitted to pass from one district to another without examination and a pass-port, bearing different imprints according to the profession of the bearer. The natives universally travel on foot; riding on horseback being a royal privilege, seldom used by the monarch himself. No horfes indeed are kept in the interior except those belonging to his majesty: nor are any horses reared in the interior. The Canadians have no fixed and established laws; though they boast of an ancient code, which remains in the hands of the king, who is its sole interpreter. His authority supersedes every other decision. The trials of the Canadians are summary; and their punish-ments, unlike the king interposes, immediate. Their capital punishments are always attended with some circumstances of cruelty; such as having the victim prostrated by elephants, pounding him in a large mortar, or impaling him on a flake. Imprisonment is a species of punishment never inflicted on a Canadian; and every species of confinement conveys ideas peculiarly horrible to their imagination. The great safe-guard of justice among the Canadians is the natural mildness and honesty of their dispositions, in which they exceed all other Indians. The Canadians, precluded from intercourse with foreign countries, and proud of immemorial independence, might be supposed to enjoy amidst their native mountains and woods, a life of tranquillity and happiness, not to be found amonst those busy nations, that are inflamed by luxury and agitated by the thirst of gain. But this is far from being the case. The oppression of their governors, the constant dread of Europeans, and the superstitious fears arising from the nature of their climate, by which they are continually haunted, deprive this isolated people of all the enjoyments which seem congenial to their situation. Much of the gloom that overhangs the minds of the Canadians originated with the oppressive exactions and destructive inroads of the Dutch. It is to be hoped, says Captain Percival, that we who are the Canadian's countrymen, by a generous and well regulated pol-icy, will speedily diminish their sources of unhappiness.
CANDY.

Percival's Account of the Island of Ceylon, 4to. 1805. See Ceylon.

Candy, the capital of the king of Candy's dominions and the royal residence, is situated in the district of Tattamun, in the midst of lofty and steep hills covered with thick jungle. The narrow and difficult passades, by which it is approached, are intersected with thick hedges of thorn; and hedges of the same sort are drawn round the hill in the vicinity of Candy, like hedges of circumvallation. The only passage through the hills by gates of the same materials, called by the natives "Carpenters," and so contrived as to be drawn up and let down by ropes. When the Candois are obliged to retreat within these barriers, they cut the ropes, and then it is impossible to force a passage except by burning down the gates, which, from their green flate, and the constant annoyance of the enemy, would prove an enterprise of some time and difficulty. These hedge-rows form the chief fortifications of Candy. The river Mahavonga also nearly surrounds the hill on which it stands: the river is here broad, rocky, and rapid; a very strict guard is kept on it, and every one who passes or repass is closely watched and examined. Although the caravans near the hill of Candy have a rampart or break-work, on which some of their artillery is occasionally mounted, it could make but a feeble reliance to the approach of a regular army; so that Candy is indebted for its principal fortifications to nature. The city itself is a mean and miserable place, surrounded by a mud wall of no strength. Our chief knowledge of this city is derived from the embassy of general Macdowal, deputed to the king of Candy by governor North, in the year 1803, of which captain Percival has given a journal, in an appendix to his account of Ceylon: but the information thus obtained must necessarily be imperfect; as the ambassador and his suite were admitted only by torch-light, and always retired before break of day.

From what they could observe the city consists of a long straggling street built on the declivity of a hill, about two miles long, with lesser streets branching off on both sides: the houses were mean and low, chiefly of mud, but their foundations were raised about 5 feet above the level of the street, so that they appeared lofty to passengers. The reason of this mode of construction is to enable the king to hold his assemblies of the people, and to have his elephant or buffalo fights in the street without interfering with the houses. Some of the houses at the upper end of the street, belonging to the principal inhabitants, are tiled and white-washed. When the king passes along the street, none of the inhabitants are allowed to appear before their houses or in the paths on a level with them, as this would be attended with the heinous indecorum of placing a subject higher than the prince defended of the sun. At the upper end of this street stands the palace, built of a kind of chesam or cement perfectly white; and containing a great number of rooms, the walls of which are painted in a grotesque manner, and covered with inscriptions: in one room is a gigantic figure of Buddha in a sitting posture, with two smaller ones at his feet. The palace is surrounded with high stone walls, consisting of two squares, one within the other. In the inner of these, to which there is access by a large arched gateway, are the royal apartments, where the court is held, and audiences are given. The hall of audience, or state-room, is a long viranda, with alternate arches and pillars along its sides, somewhat resembling the aisle of a church. At the farther end of this hall is placed a kind of platform or throne, covered with a carpet and surrounded with steps, where the king sits in state. His feet, and the lower part of his body are concealed from view by a small partition in front. On occasion of general Macdowal's reception, the courtiers were seen below the arches on each side of the hall, some prostrate, others lying on tables and ended-legged. The king was driven in a poke of how-mulla, embroidered with gold, drawn close in several folds round the waist, and flowing from thence down like a lady's gown. His arms were bare from the elbows downwards. On his fingers were many broad rings set with precious stones of different sorts, and a number of gold chains were suspended around his neck over a flint polished piece of sandal resembling Queen Elizabeth's staff. His head was covered with a turban of muslin spangled with gold, and fastened by a crown of gold, by which he is distinguished from all the other Asiatic princes. Round his waist was a rich sash, from which was suspended a short curved dagger or sabre, with the handle richly ornamented, and the hilt composed of gold filagree-work. During the conference, which lasted three hours, rock-water was frequently sprinkled round from curiously wrought vessels of gold; and perfumes were handed about on savers of gold and silver filagree-work. To one proposal made on this occasion, viz. that leave might be given to make a road, and to open a communication from Trincomalee to Columbo through the territories of the king a little north of Candy, he peremptorily refused to accede; but he expressed his decided averison from any intercourse or connexion existing between his subjects and the Europeans; professing at the same time a desire to live on amicable terms with the British, whose power he acknowledged to be far superior to that of the Dutch. On January 31st, 1803, general Macdowal began his march with a considerable force into the Candois territory, and on the 20th of February, after encountering many difficulties, arrived at Candy. The king and his chief adhirg precipitately withdrew, after having let fire to the palace and the temples. The British troops soon extinguished the fire, and took possession of the city.

Although the Candois soon afterwards appeared in considerable force, they were quickly dispersed after a dreadful slaughter. Before the British general left Candy, he adopted various measures to secure his new conquests. After some time, viz. in June, 1803, when it was thought tranquillity was established, and in the midst of a truce, Candy was attacked by the natives under the command of the first adhirg; and the commanding officer, whose troops were composed of horse and foot, and were composed of horse and foot, was set upon by the natives, and had to make a determined resistance and carry on an engagement to repulse them. The king of Candy and his subjects had then melted away, and the difficulty of evacuating the fort, under a solemn stipulation that the garrison should be allowed to proceed, with arms and ammunition, and without molestation to Trincomalee, and that the sick should also be taken care of. In defiance of this agreement, after the command ing officer left the fort, all the English soldiers who accompanied him were treacherously murdered. Shortly after this massacre, the king of Candy, finding that the British force on the island was weak, determined to attack our forts on the coast; but all his efforts were ineffectual; and the British settlements were soon restored to security. Candy, or Kandi, lies in the centre of the country, 80 miles distant from Columbo, and about 150 miles from Trincomalee. N. lat. 7° 18'. E. long. 80° 46'.

Candy, in speaking of Sugar, denotes a preparation of that substance, made by melting, and crystallizing it six or seven times over, to render it hard and transparent. See SUGAR.

Candy-fat, in Botany. See IBERIS.

CANDYBA, in Ancient Geography, one of the most considerable towns of Aisa Minor in Lycia, which, according to Steph. Byz. derived its name from Candybus, son of Deucalion.

CANDYING, denotes an operation in Pharmacy, as
well as Confectionary: those simples which are preferred in substance by boiling in sugar being said to be candied: though the performance of it is now transferred to the confectioner from the apothecary, to whom it originally belonged.

CANDYS, in Ancient Geography, a town of Asia; in Media, Pтолем. 
CANt, in Brit. See Arundo Bambus, or Bamboo. 
Cane, fig. See Saccharum. 
Cane, in Commerce, the same with reed, called among botanists Arundo, which fire. 
Canales,羌走, are said by Bradley to be joints of the roots of a sort of reed, called cano índices. This plant shoots in joints of about three or four feet long, near the surface of the ground, and at every knot produces great numbers of fibres, by which it receives its nourishment. The joints are made straight by the fire, which occasions those fibres or clouds frequently seen in them. Bradley thinks the cane-tree might be propagated here by planting some of the roots with their knots in artificial bags, &c. 
Canes may be stained like tortoise-shell, by a mixture of aqua fortis and oil of vitriol laid on them at several times over live coals, to cause it to penetrate the deeper, and afterwards giving them a gluts with a little soft wax, and a dry cloth. 
Cane, rattan, are a smaller sort brought from China, Japan, and Sumatra, very tough; which being split, are used for making of cane chairs. They are the produce of a reed called rattang Madoranica minor, or lesser rattan. The specific name is rotang, whence rattan, and in the Malayian language signifies a fluff or walking fl inc. These when dry, being struck against each other, will give fire, and are used accordingly in some places in lieu of flint and steel. Being twitted together they make cordage of them. The Chinese and Japanese vessels are said to have their cables made of them, which are less liable to rot in the water than hemp. Phil. Trans. N° 244, p. 326, and N° 267, p. 717. See Canamy. 

The canes, or canns, in the jurisdiction of Guayaquil in South America, are remarkable for both their length and thickness, and the water contained in their tubes. Their usual length is between 6 and 8 tubes; and the largest do not exceed 6 inches in diameter. The round or side of the tube is about 6 lines in diameter; so that when the cane is opened, it forms a board near 1/2 foot in breadth; and, therefore, it will not appear strange that houses should be constructed of such materials. From the time of their first appearance, till they attain their full perfection, when they are either cut down, or of themselves begin to dry, most of their tubes contain a quantity of water, with this remarkable difference, that at full moon they are entirely, or very nearly, full, and with the decrease of the moon, the water ebbs, till at the conjunction little or none is to be found. During its decrease, the water appears turbid; but about the time of full moon, it is clear as crystal. The water is found to be an excellent preservative against the ill consequence of any bruises; at least it is drunk by all who come from the mountains, where such accidents are unavoidable. The canes, being cut, are left to dry, or, as they say, to be cured; whence they acquire such a degree of strength, that they serve for ratters, beams, floors, or even mats for balzas. Ships which load with cacao are also eiled with them, to preserve the timber from the great heat of that fruit. They are also used as poles for litters, and in a variety of other ways. Juan and De Ulloa's voyage to South America, by Adams, vol. l p. 209. 
Cane, fishing-red. See Reed. 
Cane, Indian. See Cana. 
Cane, in Natural History, a name given by the common people of Ireland to the arbatus, or strawberry-tree. See Arbatus. 
Cane, Cana, a long measure, frequent in Italy, Spain, and the south parts of France; of greater or less length, according to the places where it is used. It is called by the Latins calamus, and in scripture a reed. 
At Naples, the camma is equal to seven feet 3/4 inches, English measure; the canna of Thoulouse, and the Upper Languedoc, is equal to the vara of Arragon, and contains five feet 81 inches; at Montpellier, in Provence, Danphonie, and the Lower Languedoc, to fix English feet 53 inches.

Cane, in Ancient Geography, a port-town of Arabia Felix, attributed by Ptolomy to the Adramytes, who formed a clas of the Sabzans. — Also, a promontory near this town, on the Red Sea.— Also, a promontory of Asia minor, near the Caeus. 
Cane, in Geography, a river of Hindoosan, which runs into the Jumna, 20 miles S.E. of Corah. 
Cane, in Rural Economy, a term sometimes used to signify a hollow place where water runs. It also implies a vault of alder, or other aquatic trees, in a moit boggy situation. 
Canea, in Geography, a maritime town of the island of Candia, or Cete, situate at the eastern extremity of a large bay, on the north side of the island, and supposed to have been built on the site of Cydonia, a flourishing city of ancient Crete, although no vestige of ancient edifices be now perceived. Canea, after refilling the efforts of the Ottoman army consisting of 60,000 men for 50 days, during which siege the Turks are said to have lost 25,000, was compelled to capitulate in the year 1547. Although it is much less extensive than Candia, the capital, it is the most populous and the most trading town of the whole island. In this place are reckoned upwards of 40,000 Turks, 2 or 3 thousand Greeks, 156 Jews, 4 French houses, and some Italian houes, which latter are under the protection of the emperor of Germany, or the republic of Ragusa. The form of its buildings resembles that of the houses of the East; in lieu of roofs, inclined and forming a ridge, they have a flat covering without tiles or flates, and constricting a terrace; mott of them are of brick. They are all level or flat, and the doors, windows, and shutters are made out of the line; some of them are tolerably wide; in the public buildings are fountains that flow with an abundant stream. The town is surrounded by a strong wall and a wide ditch. It has but one gate on the land side. The harbour is defended by batteries in a good condition. To the left, on entering, is seen a jetty parallel to the coast, behind which a considerable number of vessels might anchor if the bottom were cleansed. The largest are obliged to remain near the entrance of the harbour, exposed to the waves of a rough sea when the northerly winds blow with violence. If during these northerly gales, they happen to have run into it, it is not possible for them to get out; but they are obliged to lie for the very narrow mouth of the harbour, where the waves rise in 200 tons burden: the arsena and fine docks which the Venetians had contrived opposite to the jetty are falling into ruins and unfit for use. In the environs of Canea, there are some beautiful plains that are tolerably fertile and almost entirely cultivated; and they prefer wait...
The sandstone of Gavilion, and which have preserved nearly all with its appendages. Candia is about 18 miles W. of Candia. N. lat. 37° 57' 0', E. long. 34° 18'.

CANEHEAD, in Ancient Geography, a town of Asia Minor in Canea, mentioned by Ptolemy, says, that it was also called Cyen.

CANEFIELD, in Geography, a town of North America, in the state of South Carolina; 6 miles N.N.W. of Queenborough.


Sp. C. arb. Chlt. exot. lib. 4. cap. 4. Swartz in Linn. Tranac. vol. i. tab. 8. Woodville Med. Bot. p. 318. tab. 117. (C. perumum, and C. tubis microplus alba. Bauh. p. 309. 2, 3, and 4. Park th. 1391. C. cubana, Johnf. dendr. 165. C. cinnamonica, Pink. phyt. vol. 160. f. 7. C. waterana, Genr. fruct. tab. 77. f. 2.) A stem from 10 to 50 feet high, straight, branched only at the top; bark whitish; branches erect, not spreading. Leaves petioled, alternate, but not regularly, oblong, acuminate, entire, thick, dark green, shining. Flowers in terminal, compound corymb, violet, small, fleshy opening; lobes of the calyx roundish, concave, incumbent, smooth, membranous; petals concave, erect, thick, deciduous. Berry globular, helio, smooth, black. Seed fixed to the central angle of the cells, regularly two in each cell, but one or two cells are generally abortive, and sometimes only one different, of different shapes, according to the number of abortive germs and cells, always black, smooth, and shining. Swartz and Genr. The whole tree is very aromatic, and when it is in blossom perfumes the whole neighbourhood. The flowers dried and softened again in warm water have a fragrant odour, nearly approaching to that of musk. The leaves have a strong smell of laurel. The berries have a faint aromatic taste and smell, and are greedily eaten by the white-billed and black-pate pigeons (Columbia jamais. and leucoph. pl.,) who acquire from them that peculiar flavour which is so much admired. Its bark, which is in taste moderately warm, aromatic, and bitterish, and has an agreeable smell, resembling that of chieves, was formerly a common ingredient in the food and drink of the Caribs, and at present is a necessary addition to the meagre pot of the negroes. It is brought to Europe in long quilts, which are about three quarters of an inch in diameter, somewhat thicker than cinnamon, and both externally and internally of a whiten or light brown colour, with a yellowish hue, and commonly intermixed with thicker pieces, which are probably obtained from the trunk of the tree. Its virtues are extracted most powerfully by proof spirit. It has long furnished the nfc of the Caribb and other persons, with which it was confounded, first by John Bauhin, and afterwards by Linnaeus, who, in the first edition of the Species Plantarum, united the two plants under the name of Laurus waterana, but
but in the ensuing editions made it a distinct genus, and called it *winteraria*. The true codex winteranus brought by captain Winter from the sands of Magellan in the latter end of the 16th century, and described by Clusius, was, in consequence of this mistake, very rare, and imperfectly known in Europe for nearly a century, but has been recently brought again to light by the late Dr. Fothergill, with the assistance of the late Dr. Salmon. See *Wintera aromatica*.

The bark of canella alba, which has been received into the London and Edinburgh Pharmacopoeias, instead of the old bark of Winter, has been supposed to possess considerable medicinal virtues, and to be an useful medicine in the fever, and numerous other complaints; but is now considered merely as an aromatic, and is chiefly employed for the purpose of correcting, and rendering less disagreeable, the more powerful and nauseous drugs. It is, therefore, an ingredient in the Poly. Aloe. Pharm. Lond. and in the Timbura amara, *Vinum amaranium*, *Vinum rhei*, &c. of the Pharm. Edinb. See Swartz's Botanical History of the Canella Alba, in the Transactions of the Lunar Society, vol. i. p. 326. t. 2. p. 318. and Woodville's Medical Botany, vol. ii. p. 318. This tree is too tender to live in England out of a flor. It may be raised from fresh seeds procured from the West Indies, but is not readily propagated either by layers or cuttings.

*Canella*, in *Geography*, formerly called the *Kingdom of Cota*, a large district of the island of Ceylon, containing a great number of cantons, principally occupied by the Dutch, and famous for the quantity of cinnamon, which it produces. It has several towns, forts, and harbours, on the coast. The interior is inhabited by the natives, and it has rich mines of rubies, faphires, topazes, cat's-eyes, and other precious stones.

*Canella Alba*. The canella of the Materia Medica, is the inner bark of the *canella*, (which see) a common tree in the East Indies. This bark is brought over in long quills, much thicker than cinnamon, smooth, and brittle, and of a white or whitish yellow colour. To the taste it is extremely pungent, and somewhat bitter, and is not very grateful. It yields its febile qualities both to water and spirit, and has the common chemical characters of all the aromatic barks. On account of its extreme pungency it is seldom used.

*Canelli*, a town of Padmore, in the county of Afti; 12 miles S.S.E. of Afti.

*Canelos*, a town of Portugal, in the province of Tras-os-Montes; 5 miles N.N.E. of Lamego.

*Kanis*, or *Kaneis*, a name sometimes given to the country of *Africa*, called *Borna*, which see. See also *Kaneis*.

*Canenteos*, or *Caranthus*, *Charentes*, in *Ancient Geography*, a river of Gallia Aquitanica. *Ptolemy*.

*Canopus*, in *Natural History*, a name used by some of the older writers for a species of *fufilium* little known to us in its recent state, but described by *Klein* under the name of the *twinata marina canovences*, and by other of the late authors under that of *polychalumum* and *oribona-alius*.

*Canophorae*, *Kanophora*, from *kanos*, a red, and *phora*, I bear, in *Antiquity*, were two virgin qualities of Athens kept in Minerva’s temple in the Acropolis, who at the fall of the Pantheon, carried baskets upon their heads with something sweet or mysterious therein, and delivered them to the priests. The baskets were usually crowned with flowers, myrtles, &c. The canophore, in these ceremonies, always marched the first, the priest next, and the choir of music followed.

The learned are at variance about the contents of the baskets borne by the canophore. Some will have it, that neither they, nor the priestess herself, knew what was in them. Others conjecture that they contained the things necessary for sacrifice, &c.

There were also canophores in the ceremonies of Cerces and Bacchus. Those in the Bacchanalia carried golden baskets, in which were divers sorts of fruit, &c. Among ancient monuments, we find mention of divers figures of canophore. In that famous cornelian, called Michael Angelo’s ring, there are three canophores with their baskets on their heads.

The appellation *canophore* was also given to virgins at Athens, when becoming marryable, they presented certain baskets full of little curiosities to *Dura*, in order to procure leave to quit her train, and change their state of life.

*Canephoria* was a ceremony, which made part of a feast celebrated by the Athenian virgins on the eve of their marriage day. The canephoria, as practiced at Athens, consisted in this; that the maid, conducted by her father and mother, went to the temple of *Minerva*; carrying with her a basket full of presents, to engage the gods to make the marriage happy; or rather, as the scholiast of *Theocritus* has it, the basket was intended as a kind of honourable amends made to that godde, the protectress of virginity, for abandoning her party; or it was a ceremony to appease her wrath.


2. *C. capitata*. *Lam.* 111. pl. 151. fig. 2. *Leaves lanceolate; flowers terminal, aggregate, involucrated."

*Leaves opposite, nearly sessile; entire. Flowers three or four together; leaves of the involucrum numerous, bristle-shaped. Both species found by *Commeron* in the island of Madagascar.

*Canes*, in *Egypt* and other Eastern countries, a poor sort of buildings for the reception of strangers and travellers. People are accommodated in theem with a roof at a small price, but with no other necessaries; so that, excepting the room, there are no greater accommodations in these houses than in the deserts, but that there is a market near.

*Canes Fenorii*, in *Aifternum*, the Grey-bounds, two new constellations, first discovered by *Hvelbin*, between the tail of the Great Bear, and Boötes’ arm, above the Coma Berenices. The first is called *Afferian*, being that next the Bear’s tail; the other *Carina*. They comprehended 23 stars, of which Tycho only observed two. In the British catalogue they are 25.

*Canescens*, in *Entomology*, a species of *Aptis* mentioned by *Lepelchin* in his travels through Siberia. This insect is hoary, stout incurred, horry, projecting from a conic vehicle: abdomen with obscure blotches. Inhabits near the Calpian sea.
CANESCENS, a species of Cantharis found in Saxony. The thorax is yellow; sternum and elytra obscure cinereous. Schall.

CANESCENS, in Liliobatrach., a species of Chrysophyphus that inhabits South America and India. The tail of this frog is biled; both lower rays of the dorsal fin spines, the third very long; month indented. Gen. Linn. Syll., &c. Figured by Schel. v. 2. pl. 25.

CANESCENS, in Orotoni, a species of Motacilla, that inhabits New Holland, the plumage of which is bronze-brown above, and white beneath; head black; front streaked with white; breast and vent bracted with black; spot on the wings, and edge of the tail-feathers at the base tawny. Called by late writers the Van Diemen's warbler.

CANET, in Geography, a town of France, in the department of the Eastern Pyrenees; 5 miles E. of Perpignan. Also, a town of France, in the department of Haurta; 10 miles S.E. of Lodève.

CANECE, See Cagnate.

CAMESTHMUS, in Ancient Geography, a mountain of Greece in Batavia. Also a place of Greece, in the island of Euboea.

CANEPO, in Geography, a town of the duchy of Mantua, seated on the river Oja; 20 miles W. of Mantua. N. lat. 47° 55'. E. long. 10° 46'.

CANEVAR, Dr., an outline for a poet or musician to colour. The French chiefly use the term in writing words to favourite airs in a ballet; which, after being danced to inflations, is improvised more deeply in the memory of the audience by being sung. The word seems to be used with more propriety when applied to a slow and pathetic air, left by the composer, as a mere sketch for the finger to grace and embellish. See Camarilla.

CANTE, in Geography, a town of Spain, in Arragon, 3 leagues N. of Jaca.

CANGA, called by the Portuguese Canga, and in China Chia, in the Chinese Police, a wooden clog or collar borne on the neck, by way of punishment for divers offences.

The canga is composed of two pieces of wood netched, to receive the criminal's neck, and this frame of wood has also two small holes for the hands of the offender. The load lies on his shoulders, and is more or less heavy according to the quality of his offence. Some cangas weigh 200 pounds; but most of them from 50 to 60 pounds. It is a kind of permanent and ambulatory pillory, which the culprit is sometimes sentenced to wear for weeks or for months. The duration of this punishment for having broken the peace, or disturbed a family, or for being a notorious gambler, is generally three months. Although he is forbidden to look about, or to sit down for a certain space of time either in some public square, or at the gate of a city or a temple, and occasionally to rest under this heavy and degrading burden; yet if the offender is thought by the subordinate officer of the civil magistrate to have reformed too long, he is beaten with a whip made of leather thongs till he sinks. The mandarins condemn to the canga. When the time of his punishment is expired, he is again brought before the mandarin, who exhorts him in a friendly manner to amend, frees him from the canga, and discharges him after he has received twenty heavy blows.

CANGIANI, promontory of, in Ancient Geography. See Cangani.

CANGAREE, in Geography, a river of America, in South Carolina, formed by the union of the Saluda and Tyger: about 5 miles N.W. from Columbia.

CANGE, CHARLES DU FRANCAIS DU, in Biography, an eminent linguist and antiquary, was born in 1610, at Avincs, Vol. VI.

where, after attending the bar for some time at Paris, he devoted himself to the study of the heraldic language, and of ancient and modern history. In 1645, he obtained the post of treasurer of France; and continued at Avincs, editing literary avocations with the function of his office, till a pellicle, which prevailed in his native city, in 1660, obliged him to remove to Paris, where he enjoyed peculiar advantages for the prosecution of his studies. Here he was held in high estimation for his extramural learning. By the modency and diligence with which he always employed himself concerning his own talents and literary performances, and for the coherence and ability, which distinguished his social conversations. After having resided for 50 years, without interruption, a good state of health was restored to him, in 1688, with a retention of sense, which, in a few months, terminated his life. Of his learning, which were numerous, the following are the principal: viz. "History of the Empire of Constantinople under the French Emperors," Paris, 1657, fol. "History of St. Louis, King of France, by the Seur de Jouville, illustrated with new Remarks and historical Illustrations," &c. Paris, 1660, fol. "James Chauvin's six Books of the History of the Affairs of John and Manuel Comnenes, &c. and Lat. with historical and philosophical Notes, &c." Paris, 1670, fol. "A Memoir upon the Plan of a new Collection of the Historians of France," inserted in Le Long's Bibliothèque Historique de la France." "Glottarius ad Scriptores mediae et infima Latinitatis, &c." Paris, 1678, 8 vol. fol.; tantum 1681 and 1708, 3 vol. fol.; reprinted in 1735, by the Benedictines of St. Maur, and augmented with 4 new volumes by the abbe Carpentier. To this work Du Cange owes his chief reputation. It is of singular use to those who study the writings and records of the middle ages, and abounds with many interesting and amusing anecdotes. "Cyrilli Philoxeni, alterannae Veterum, Goglari, Latino-Graecae et Graeco-Latinae," 1679, fol. "Historia Byzantina, duplaci Commentario illustrata, &c." Paris, 1689, fol. containing the genealogies of the emperors of Constantinople, and an accurate description of the state of that city under these emperors. "Joannis Zonariz Annales ab Excido Mundi ad Mortem Alexii Comneni, &c." Paris, 1685, 2 vol. fol. "Glottarius ad Scriptores mediae et infima Graecitatis; accedit Appendix ad Glottariun mediae et infima Latinitatis, unam cum brevi etymologico linguarum Galliae et urtiquo Glottario," Paris, 1668, 2 vol. fol. "Chronicon Paschale a Mundo condito ad Heraclii Imperatoris annum vigintinum," Paris, 1689, fol. Whilst this work was in the press, the learned author died; and it was completed and published by M. Baluze. His MSS., which were numerous, are preserved in the king's library. Gen. Dict. Neuv. Dict. Histoire.

CANGI, CANGI, of CANGI, in Ancient Geography, a people of Britain, concerning whose situation antiquarians have been much perplexed. Camden discovered some traces of them in many different and distant places, as in Somersetshire, Wiltshire, Dorsetshire, and Cheshire; and others have found as plain veliges of them in Devonshire, Dorsetshire, Wiltshire, &c. Mr. Basset, (Gloef. Brit. p. 73, &c.) seems to have discovered the true cause of this perplexity, by observing that the Cangi, or Cangi, were not a distinct nation seated in one particular place, but such of the youth of many different nations as were employed in pallingage, in feeding the flocks and herds of their respective tribes. Almost all the ancient natives of Britain had their Cangi, the keepers of their flocks and herds, who ranged about the country in great numbers, as they were invited by the seacon, and plenty of pasture for their cattle. Hence we find traces of
their name in many different parts of Britain; but chiefly in those parts which were best adapted to pastoral. These Scangi of the different British nations, naturally brave, and rendered still more hardy by their way of life, were constantly armed for the protection of their flocks from wild beasts; and these arms they conveniently employed in the defence of their country and their liberty.

**CANGIAGIO,** or **CANNESIO, LUCA,** called **Luchet-

... to, in *Biography,* one of the most eminent of the Genoese painters, was born at Onglia, near Genoa, in 1527; and, being of a volatile disposition, was laid under restraint by his father, who was his teacher in the art of painting. At the age of 17, he was employed in painting the front of a house in fresco; but whilst he was commencing his work, some Florentine painters who were actually engaged, conceived him to be a mere grinner of colours, and when he took up his pallet and pencils, they wished to prevent his proceeding with it, lest he should spoil the work. However, after a few strokes of his pencil, they were convinced of their mistake, and respected his singular abilities. In the exercise of his art, he was uncommonly expeditious and rapid, and as he worked equally well with both hands, his performances were numerous and speedily executed. Of Cangiagio it is remarked, that he practised three different modes of painting at three different periods of his life. His first manner was gigantic and unnatural, which he corrected, in consequence of the remoteness of his friend Aleff, the celebrated architect, for his belt flyk, in forming which he confused nature with attention, and directed his thoughts in sketches, before he began to paint. His third manner was distinguished by a more rapid execution, to which he recurred in order to make more ample provision for his wife and family. The death of his wife was followed by a violent passion for her father, to whom he committed the care of his children. With a view of obtaining a dispensation from pope Gregory XIII., he took a journey to Rome, in 1576, and enforced his request by presenting two pictures to his holiness. The pope, however, inferred that he should dismiss his father-in-law from his house. After this unsuccessful application, he prosecuted the execution of his profession at or near Genoa, and performed some admirable works in the convent of St. Bartholomew of the Armenians. He was afterwards invited by Philip II. to adorn the Escorial; and he complied with the invitation, in hopes of interting this powerful monarch in favour of his unallowed and disquieting passion. But the king's courtiers deterred him from communicating his request, much as his performances were admired, to a prince so religious. These repeated disappointments preyed upon his mind, and brought on a lingering complaint, which terminated in his death, at the Escorial, in 1585. "A great facility of hand, skill in drawing, especially foreshortened figures, and fertility of invention, were the characteristic excellencies of this painter; but he failed in grace, felection, and the truth of nature." In the royal collection at Paris there are a "Sleeping Cy-
pid," as large as life, and likewise "Judith with her At-
tendant," which do honour to this master. In the Pem-broke collection at Wilton, there is a picture, representing Chrift bearing his crofs, which is ascribed to Cangiagio.

**D'Argenville.** Pilkington.

**CANGIAMILA, FRANCIS, EMMANUEL,** canon of the church of Palermo, and inquisitor of the island of Sicily, where he died, in 1763, published "Embryologia facra, sine de officio saccodum, medicorum, et aliorum circa exter-

... man pavulum in utero exsiliometium sulatum." Palermo, 1761, fol. By the canons of the church of Rome, it has been decreed, that children may be efficaciously baptized before they are born, if the water can be made to touch any part of their bodies, or the membranes in which they are involved; and surgeons are cautioned to see this cer-

... mony performed, whenever, from the difficulty of the labour, the life of the child shall appear to be in danger. On the other hand, they are authorized, that, to open the head of a child before it is certainly known to be dead, with a view of pre-

... verving the life of the mother, is to commit murder, and consequently not to be allowed. An abridged edition of this work was published by the abbe Dinonart, in 1761, and 1766, 12mo. Haller Bib. Nat. Eloy. Dift. Hist.

**CANGIANO,** in *Geography,* a town of Naples in the province of Principato Cita; 27 miles N. of Pulciarfo.

**CANGOXIMA, CANGONUMA, or COGONIMA,** is a fort on the most southern verge of the isle of Japan. It was the first at which the Portuguese landed, and they afterwards chose to make it the centre of their commerce, on account of its advantageous situation and commodious harbour. The entrance into it is, indeed, dangerous by reason of a number of rocks, that lie at some distance from it; on one of which is seated a strong caffle, said to have been built by Ongofchior, the grandfather of the emperor Gon-

... gon, or Gonjin, with a view of securing the city, which is the key of the kingdom of Saxam, and of the whole island. At the entrance of the haven was constructed a square light-

... house, situate on a very high rock, which is visible at sea at the distance of about 20 miles; and at the foot of the rock is a convenient road for shipping. The quay is guarded by a stone dyke, which runs into the sea, and has a stone rampart breast-high, covered with copper. In each of 2 large wings built at one end of it are stationed 500 men, who keep watch night and day, to check the kings of Saxuma, who often revolted in order to avoid paying tribute to the emperors. The town is watered by a river which descends from the mountains into a canal formed for receiving it, and from thence it falls with great rapidity into the sea. On the south side of the river is a custom-house for receiving duty, besides other large and sumptuous magazines belonging to the emperor.

**CANHAR, a river of Hindoostan, which runs into the Soane, 5 miles S.W. of Bidigur.**

**CANI, two small flat islands of Africa, in the Medi-

... reanne, near the coast of Tunis, situated about 4 leagues to the north-west of the cape Pil-leg, and very nearly in the middle way to cape Blanco. These islands seem to oc-

... cupy the situation assigned by Plowemy to his Insula Dra-

... contia. N. lat. 37° 45' E. long. 16° 50'.

**CANI, Graoto del. See Graoto del Cani.**

**CANJA, in Nautical Language, a vessel employed on the Nile, and represented by Mr. Bruce as commodious, fast, and expeditions in fishing. That which he describes (Travels to Africa, Vol. I. p. 43.) was about 400 feet from stem to stern, with two masts, main and foremast, and two mon-

... torous latitude fails, the main-fair-yard being about 200 feet in length; about 30 feet in the beam, and about 90 feet in keel. The keel is not straight, but a portion of a parabola whose curve is almost insensible to the eye, but having this advantageous effect in failing, that as the bed of the Nile, when the water becomes low, is full of sand-banks under water, the keel under the stem, where the curve is greatest, first strikes upon these banks and is fast, but the rest of the vessel is afloat; so that by the help of oars and aid of the stream, furting the falls, you easily get off; whereas, if the keel were straight, and the vessel advanced with the pre-

... fure of its immense main-fall, it must remain immoveable upon the bank, and be wrecked. When this vessel is pro-

... ceeding up the stream, before the wind, the yard and sail are 8 never
This opinion, equally erroneous and superfluous, seems to have originated with the Egyptians, who, observing this rising of the Dog-flair, which usually took place in April and May, about the time of the sun’s arrival at the equinox, when the Nile began to rise, upon the changeful state of which the fertility of their country depended, were induced to pay divine honors to this star. They regarded it not only as an indication of the time of the Nile beginning to rise, but that it was the efficient cause of its overflowing, or of the fertility connected with this circumstance. From the color of the star at the first appearances, they supposed the color of what kind of fevers they were to expect; but when it was of a golden colour, they thought it prognosticated a fruitful year, but if it appeared pale and dim, they regarded it as a harbinger of bad omen, that portended a scarcity. They were of opinion also, that the Dog-flair rising with the sun and moon, and accompanied by the fire of that luminary, was the cause of the extraordinary heat which usually falls in that season, and accordingly that they gave the name of the dog-days to about six or eight weeks of the hottest part of summer. The Greeks, in imitation of the Egyptians, their molitors in solitude and superstition, as well as science, held the same opinion, that the Dog-flair was the cause of that sultry heat so often pernicious to the health and life of man. Homer, (Iliad, i. xxii. v. 30) comparing the flaming of the armour of Achilles, whose fury was so fatal to the Trojans, to the pernicious blaze of the Dog-flair rising at the end of summer, calls it an ill omen, “portending heat intense to wretched mortals;” or as the end of the passage is well expressed by Pope:—

“Thais the red air with fevers, plague, and death.”

When the father of the poets had expressed himself in this manner, it is no wonder that others should speak of the rage of the dog-flair, as some of them do of the fury of the hor, (Hor. I. iii. Od. 9, Virg. Aen. i. x. v. 270.) because a star of the first magnitude, called the Lion’s heart, rising in the time of the dog-days, was also thought to contribute towards the great heat of that season.

Some authors tell us, from Hippocrates and Pliny, that on the day the Caniculae or flars in the morning, the sea boils, wine turns sour, dogs begin to grow mad, the bile incares and irritates, and all animals grow languid; and that the diseases ordinarily occasioned in men by these burning fevers, dysenteries, and phrenises. Although Hippocrates had a sentence or aphorism that seems to forbid the use of purging medicines in the dog-days, we must not conclude from hence that great physician and philosopher to have thought the influence of the Dog-flair considerableness. It is probable, that he only meant to point out the hot time of the year, commonly marked by the rising of the Dog-flair. The Romans sacrificed a brown dog every year to Canicula at its rising, to appease its rage. They supposed Canicula to be the occasion of the sultry weather, usually felt in the dog-days.

As to the dog days attended by some with so much superfluous regard, it is pleasant to observe what variety of opinions have prevailed both among the ancients and moderns about the beginning and the end of them. This variety is, in some instances, owing to the ignorance of the writers, who did not know or consider that the Dog-flair varies in the time of its rising in any one year as the latitude varies, and that it rises later and later every year in all latitudes; so that in time this star, by the same rule, may chance to be charged with bringing frost and snow, when it rises in winter. In an ancient calendar preferred by Belis, the begin-
ning of the dog-days was placed on the 14th of July. In one prefixed to the common prayer, printed in the time of queen Elizabeth, they are Eiad to begin on the 6th of July, and to end on the 5th of September; and this was so fixed from that time till the reformation, when that book was revised, and the dog-days omitted. From that time to the correction of the British calendar, our almanacs had the beginning of the dog-days on the 15th of July, and the end on the 28th of August; but since that correction, the times of the beginning and end have been altered; and the former was placed at the 20th of July, and the latter at the 7th of September. The dog-days have been commonly reckoned for about 40 days, viz. 20 days before, and 20 days after the heliacal rising; and almanac-makers have usually set down the dog-days in their almanacs to the changing time of the star’s rising; and thus they had at length fallen considerably after the hottest season of the year; till of late, a very proper alteration has been introduced into the almanacs, and they have been made to commence with the 3d of July, and to terminate with the 15th of August. The propriety of this alteration will be evident, if we consider, that the ancients meant to express by the dog-days, the hottest time of the year, which is commonly during the month of July, about which month, the Dog-star rose heliacally in the time of the most ancient astronomers, whose observations have been transmitted to us: but the predications of the equinoxes has transferred this heliacal rising of a much later and cooker part of the year; and because Hefiod tells us that the hot time of the year ends on the 30th day after the summer solstice, which brings us to about August 10, or 11, the above-mentioned alteration seems to be not only necessary, but very proper.

Canicular year, denotes the Egyptian natural year, which was computed from one heliacal rising of Canicula to the next. This is also called annus canarius, and annus cynicus; by the Egyptians themselves the Sothic year, from Soth, a denomination given by them to Sirius. Some also call it the heliacal year.

The canicular year consisted ordinarily of 365 days, and every fourth year of 366 days, by which it was accommodated to the civil year. The reason of their choice of Canicula before the other stars, to compute their time by, was not only the superior brightness of that star, but because its heliacal rising was in Egypt a time of singular note, as falling on the greatest augmentation of the Nile, the reputed father of Egypt. Ephraim adds, that from the aspect of Canicula, its habit and colour, the Egyptians drew premonitions concerning the rise of the Nile; and, according to Florus, predicted the future state of the year. So that the first rising of this star was yearly observed with great attention. Bainbrige, Canicul. cap. 4. p. 26.

As the Egyptian year of 365 days was about six hours shorter than the true solar year, the heliacal rising of Sirius gradually advanced, at the rate of nearly one day in the interval of four years; so that in 1461 years, it completed a revolution, by rising on every successive day of the year, and returning to the point originally fixed for the beginning of the first month, called Thoth, or Soth. This period, equal to 1460 Julian years, was termed the great Egyptian year, or “Canicular cycle.” Cenformius (De Dei Nat. c. 18.) informs us, that in the confutation of Antoninus Pius, and Brutus Prefens, A.D. 138, the canicular year was renewed. If we reckon backwards 1460 Julian years, we come to the year B.C. 1322, when the sun was in 14° of Cancer, that is, 14 or 15 days after the summer solstice, which happened on July the 5th. Again, in the beginning of the Nabonassarean era, i. e. B.C. 747, the Thoth, or first day of the Egyptian year, had receded to the 26th of February, from July the 20th, when Sirius had been observed to rise heliacally in Egypt. This interval of 1444 days, multiplied by four, gives 576 years. The canicular year must, consequently, have begun 576 years earlier than the era of Nabonassar, viz. in the year B.C. 1722, or 1323, which nearly corresponds with the former date. In this matter, great accuracy cannot be expected, as the observation of the heliacal rising or setting of a star depends upon the state of the atmosphere, the difference of latitude, the situation of the observer, and other circumstances. Bailly (H. de l’Alphon. i. vi. c. 8.) fixes the date of the establishment of this period in the year B.C. 2752, on the authority of a passage said to have been extracted out of Manetho’s history, which intimates, that the shepherds invaded Egypt in the 700th year of the Sothic cycle; and in a vague tradition, that it commenced when Sirius rose heliacally at the summer solstice. But the grounds of this opinion are such as to entitle it to no great regard.

Caniculatus, in Conology, a species of Mytilus that inhabits New Zealand. The shell is smooth, and brown without, the interior surface tinged with various colours, and the socket of the hinge grooved. Martyn. &c.

Caniculum, or Caniculus, in the Byzantines Antiquities, a golden flannel, or ink veil, decorated with precious stones, wherein was kept the sacred enclymus, or red ink, wherein the emperors signed their decrees, letters, &c. The word is by some derived from canis or caniculus; alluding to the figure of a dog, which it represented; or rather because it was supported by the figures of dogs. Ermanni it is derived from canis, an inkhorn. The caniculum was under the care of a particular officer of state, hence called caniculus or caniculus, who was in great respect. Du Cange will have the caniculus to have been the name with the logotheta.

Canigou, in Geography, an eminence of the Pyrenees, about 1440 French toises.

Canina, a town of European Turkey, in Albania; situate in a district of the same name on the sea-coast, near the gulf of Venice. N. lat. 45° 28'. E. long. 15° 50'.

Canina, in Zoology, a species of Asciata that inhabits the Atlantic and northern seas. It is of an elongated shape, round and faceted, with a red pock. Mull. Zool. Dan. Obf. This is the fac-animals of Decumur and Menula marina of Reel. Bohadi in calls it Tibetan feculentum.

Canis, a species of Boa, defended by Linnæus as having 223 abdominal plates, and 77 caudal scales. This beautiful snake is an inhabitant of South America; where it frequently rolls itself round trees, from whence it can the more readily perceive and dart upon its prey. The usual length of this snake is about four feet, and its thickness is moderate in proportion. Its head is large, and bears such a striking resemblance to that of a dog that Linnæus gave it the specific name of canis, in allusion to that circumstance. The colour of the whole animal on the upper parts is of a fine saxon-green, with several short, undulating, transverse white bars down the back, the edges of which are of a deeper green than the ground-colour of the body: the abdomen is white.

Boddart speaks of a specimen of this boa in which the abdominal plates amounted to 205 instead of 223, at the same time that the sub-caudal scales were, exactly the same in number as Linnæus describes them. That examined by Gronovius differed in both particulars from the Linnæan specimen, having 205 abdominal plates and 79 sub-caudal scales.

Laurenti describes this species under the title of boa thalassa;
affinis: Seba by those of Serpent Bojoli Brasilienis, Tetranchnosth, Theola, and Lithisn Cohe verde.  

There is another kind of snake very closely allied to the above species, that inhabits the East Indies, and is supposed by Gmelin to be a variety only of the same snake. Laurenti calls it Boa aurrantias, and Seba Serpent Bojoli cyano ps, the ground colour is of a fine orange; the dorsal bands pale yellow, edged with red, and the abdomen pale yellow.  

CANINANA, the name of a species of serpent found in America, and classed one of the less poisonous kinds. It grows to about two feet long, and is green on the back, and yellow on the belly. It feeds on eggs and small birds; the natives cut off its head and tail, and cat the body as a delicate dish.  

CANINE, in a general sense something that relates to dogs.  

CANINE appateps, appetutis of fames canina. See .  

CANINE laughter, risus caninus, that wherein the lips are drawn far back, and the mouth much extended.  

CANINE ligament, is that whereby the prepuce of the human penis is fastened to the glans, otherwise called the frenum.  

CANINE madnica, rabies canina. See Hydrophobia.  

CANINE sulphur, a sort of native sulphur, discovered near Reggio, intermixed with earthy or rocky matters; thus called by reason that dogs are so fond of it, as to dig it out of the earth.  

CANINE teeth; canini dentes. See Teeth.  

Canis, in Geography, a town of Africa, in the kingdom of Angola; seated on the river Lualaca, S. lat. 5° 56'. E. long. 17° 38'.  

Canis, Angelo, in Biography, a learned grammarian of the sixteenth century, was born in a small city in Tuscany, called Anglera, or Angolari; and employed himself for several years in teaching the Oriental languages in Venice, Padua, Bologna, Rome, Spain, and France. At Paris he lived for his scholars, Andrew Duddith, an Hungarian, afterwards celebrated for his learning and eruditions. At length he entered into the service of William du Prat, bishop of Clermont; and he died in Avignon in 1557. His "Institutiones Linguae Arabicae inactae Thalmudice, in una cum Athiopicae atque Arabicae Collatione," Paris, 1554, 4to, are much esteemed. His "Gregor Grammar," or "Hellenismus," Paris, 1555, 4to, has been highly commended; and by Tuanqui Faber of Suebur, who prefers Caniinius before all other grammarians, it is denominated "The Treasury of Hellenism." "A Latin Translation of Simplicius's Commentary upon Epictetus's Manual," printed at Venice in 1546, fol, is attributed to this author. Gen. Dict.  

Canis, in Ancient Geography, a country of Rhasia, supposed to be that of the Cretans.  

Canis musculus, in Anatomy, the name for elevator labii superioris, which see.  

Canipolils, in Ancient Geography, the name of an ancient episcopal town of Thrace, mentioned in the acts of the council of Sardica, held in 347.  

Canis, or Cappina, a town of Arabia Felix, seated on the Persian gulf; W. of the mouth of the river Lar. Potemenius.  

Canis, in Zoology, a species of Scoros, that infests the inhabitants of the common dog. This kind is distinguished by having the tail pointed, the head flat, and furnished on each side with a wing-like membrane, and the sphenial vessels curved. Wern. Vorn. Intell. &c.  

Canis, a genus of the Mammalia Fera, distinguished by the following characters: fore teeth, upper six; lateral ones longer, dilated; intermediate ones lobate; lower 4x, lateral ones lobate: milks solitary and incurvated; grinders six, seven, or more than seven.  

This genus comprehends the common dog, familiaris, and its varieties, with the species Lupus, Mexicano, Thamus, Hevia, Canista, aurerus, Mesolomeo, Lycaeon, Vulpes, Alpex, Canis, Canis, Canis, Canis argentarius, virginarius, Pygargus, and Cerulo, which see respectively.  

Case Major, the Great Dog, in Astrology, a constellation of the southern hemisphere below Orion's feet, though forming a separate and well-defined form, whose stars Ptolemy makes 17; Tycho only counted 13: Hevelius's 54 in the Britannic Catalogue; they are 51.  

It is unnecessary to advert to the fables of the Greeks concerning the elevation of the dog to the heavens, as the origin of this constellation, as well as of its other name, Sirius, is more probably to be found in the superstition of the Egyptians; who, as we have already observed, (See Canis Major), carefully watched the rising of this star, and judging by it of the tailing of the Nile, called the star the continual and watch on the year. Hence, according to their mode of hieroglyphic writing, they represented it under the figure of a dog; they also called this star Isis, the same given to their great goddess, and Thoth, the name of the god Mercury, whom for his faith, in the invention of letters, arts, and sciences, they sometimes painted in the form of a dog, or of a man with a dog's head, and worshipped him under the name of "Amonis," which fce. They called the same star "Solis," or "Sithis," which, in the Egyptian language, according to Kircher, signifies holly. Sicor and Sirius are also other names for the Nile, from whence Voilhuis derives Sirius, the Greek name of this star, which was imagined to have such dominion over that river; and also Obiris, the name of one of their principal deities.  

Canis Minor, the Little Dog, a constellation of the northern hemisphere; called also by the Greeks, Procyon, and by the Latins Antennis and Canida. This, as well as the former, is one of the old 48 constellations. According to the fables of the Greeks, it is one of Orion's hounds; but the Egyptians were probably the inventors of this constellation, as well as Canis Major, and they might have given it this figure to express a little dog, or watchful creature, preceding and conducting, as it were, the larger, or rising before it; hence the Latins have denominated it Antennis, which fce. The stars in the constellation Canis Minor are in Ptolemy's Catalogue 2; in Tycho's 5; in Hevelius's 13. In the British Catalogue they are 14, of which the principal is Procyon.  

Canis flumens, or Cyynos flumens, the river of the dog, in Ancient Geography, a river of Arabia Felix, which discharged itself into the Persian gulf; probably the fame with the Lar of Ptolemy.  

Canis Carcarius, in Ichthyology. See Squalus Carcarius.  

Canis Galeus. See Squalus Galeus.  

Canis Vulcanus, in Zoology, a name indiscriminately given by old writers to the vampire and terrane bat, Vespertilio Speratum and Vampyrus. Canis vulcanus was also called vespertilio cauda nullls, both the above being of the tailless kind of bats. Canis vulcanus terranatus orientalis of Seba is the Great Bat. Canis vulcanus maxima aurita in Nova Hispania of the fame writer is the Vampire of Buffon.  

Canis BAY, in Geography, a small fishing town of Scotland, in the county of Caithness, and most northern part of Scotland; 11 miles N. of Wick.  

Canischa, a town of Hungary, taken by the Turks in 1600 and retained by them till the year 1660, when it
was captured by the imperial troops after a blockade of 2 years, and ceded to the emperor by the peace of Carlowitz, 96 miles S. of Vienna.

**CANISIUS, Henry.** in _Biography_, a native of Nim­

guen, who became professor of canon law at Ingolstadt, and

who was so little distinguished for his piety and modestly

for his erudition. He died in 1515. Among his works in

law and antiquities, which are highly esteemed, we may

mention his “Summa Juris Canonici”; “Commentarium

in Regulæ Juris”; “Prefationes academicae de Decinis


containing a collection of curious pieces relating to the

history and chronology of the middle ages, printed by J.

Bañinger, in 7 volumes, 4 vols. fol. Amsterd. 1753, with

learned prefaces and remarks by the editor; and noted, with


**CANISOLA, in Geography,** a town of the island of

Clerfo, in the Adriatic; 32 miles N. of Clerfo.

**CANISTER, Great,** a small island in the bay of Bengal,

near the coast of Siam. N. lat. 12° 58’. E. long. 97°

40’.—Little Canister, another small island in the same bay

and near the same coast; 2 leagues S. from the former.—

**Wolf Canister,** a small island in the same bay, near the same

coast. N. lat. 12° 37’. E. long. 97° 16’.

**CANSY, a town of France,** in the department of the

Channel, and chief place of a canton, in the district of St.

Lo, 4 miles S.W. of St. Lo. The place contains 836,

and the canton 9560 inhabitants; the territory includes 90

kilometres and 12 communes.

**CANITZ, Baron of,** in _Biography_, a German poet and

statesman, was of an ancient and illustrious family in Bran­
denburg, and born at Berlin in 1654. After having com­
pleted his early studies, he travelled to France, Italy, Hol­
lund, and England; and upon his return, he was charged

with important negotiations by Frederic II. He was also

employed by Frederic III. Although he was more exten­

sively known as a politician than a poet, his poems have

been much admired by his countrymen, and they were pub­

lished for the tenth time in 1750, 8vo. Most of them were

of the moral elegiac kind, expressive either of the tenderer

sentiments of conjugal affection, or of such reflections as

naturally occurred to a contemplative and virtuous mind on

the various events of life. Horace is said to have been his

model, and his compositions are written in a pure and deli­

cite style. He was eminently learned and ingenious, virtu­

ous and benevolent. Having attained the office of privy

councillor of state, he employed the influence acquired by

his distinguished character and high station in giving encou­
ragement to literature and the fine arts. The disease which

terminated his life was tedious and lingering, and he observed

the flow but certain approaches of his last enemy with the

calmness and fortitude that became the churlish philos­

opher. When his physicians had pronounced his case to be hopeless,

he ordered a cake to be brought to him, and dictated some poetic meditations on this object in connection with his

own circumstances, which are justly deemed the most beau­
tiful of his productions. He retained his cheerfulness to the

last; and just before his death, desired to be led to the

window, which he opened when, having gazed some

minutes at the rising sun, he exclaimed, “O! if the view

of a part of the creation can be thus beautiful and reviving,

how infinitely delightful must be that of the Creator!” He

spoke, and died, in 1699, at the age of 45. Bildnisse, &c.

or Portraits of celebrated German literati, &c. Berne, 1793.

**CANKER, in Gardening,** a vegetable disease common

in fruit and other trees, produced by a form of ulceration in

the bark arising from bruises, the old or dead wood remain­
ing on the trees, and various other causes. It is observed

by the author of the _Philosophy of Gardening_, that this

disease may be termed _gangrenous vegetable_, and that it is

a phagedenic ulcer of the bark, which is very destructive to

apple-trees and pear-trees, as it spreads round the trunk or

branches, and destroys them. Mr. Knight has observed: “It

to be most frequent and fatal to those trees the fruit of

which has been long in fashion, having been perpetually

propagated for a century or two by grafting; which he

believes to be the continuation of the old tree, though now

nourished by a new flock; and that the canker is thus a disease

of old age like the mortification in the limbs of elderly

people, and arises from the irritability of a part of the system.”

But it seems more probable in the opinion of the first

writer, that “it is an hereditary disease, as the buds of

trees being a lateral progeny, and more exactly resembling

their parents, must be more liable to the diseases gradually

acquired, or increased, by the influence of soil or climate,

and have not the probability of improvement which attends

the progeny of sexual generation. It is nevertheless fre­

quently produced on trees by external violence, as a stroke

with a spade given by a careless labourer who is digging

near them; but this probably may more easily affect the

old grafts above-mentioned. When a definition of the

bark is thus produced by external violence, it may possibly,

he supposes, be cured by the application of a piece of

living bark from a leaf valuable tree bound upon it.”

It is likewise recommended, that “the edges of these

gangreensulcers of the bark should be nicely pared off

with a knife, so as to admit the air and to prevent the

depredations of insects, and the lodgment of mould, which

might promote the purrefaction of the elegant juices, and spread the gangrene. This should be so managed as only to

cut away the dead lips of the wound, but not so as to

injure the living bark. Some thick white paint may then be

smear upon the naked albumen, or sap wood, on a dry day,

which may prevent insects from infiltrating their eggs into it, and producing maggots, which erode and destroy the

wood, and may also prevent the dews and rain from rotting it. The paint should, nevertheless, be so spread as not to

touch the edges of the wound, as it might injure their growth by its poisonous quality. A quarter of an ounce of sublimine of mercury,

“hydrargyrum nitidum” rubbed with about a pound of white

lead-paint renders it more noxious to insects.”

Mr. Forsyth thinks it a mistake that it always depends

upon the nature of the ground, as four clays or flinty

gravels. He contends that it invariably proceeds from the

branches to the roots of the trees, and never in the contrary
direction.

In the case of this disease, when extensive, he advices

the careful paring off with a draw-knife or other convenient

instrument of “all the diseased parts of the bark.” And that

as the inner white bark is frequently infected, this must also

be cut away, till no appearance of infection remains. The

infection in the inner bark appears like dots made with a

pen, all of which must be cut clean out; for if any part of

the canker be left, it will infect the new wood and bark.

Wherever you see gum oozing out, you may rest assured

that the canker is not quite eradicated; which, if suffered to

remain, will spread till the whole tree becomes a mass of

gum and canker, and will be killed in a very short time.

When the trunk is become hollow, cut the loofe rotten part

clean out, till you come to the sound wood, taking care to

round the edges of the hollow part; then apply the com­
position in a liquid state, laying it on with a painter’s

brush wherever the cankered bark has been pared off or

the
the dead wood cut out, till these places are entirely covered with it; when that is done, flake some of the powder of wood ashes and burnt bones over the composition, and pat it gently down with your hand." See Composition.

He contends, "that if the foregoing directions be carefully followed, the canker will be completely eradicated, and the hollow trunk in time be filled up with sound wood. When the wood is much decayed, he thinks it will be absolutely necessary to open the ground, examine the roots, and cut off all the rotten parts. When you have cut off all the rotten and decayed parts below ground, and scraped the hollow clean, make up the root of the composition, mixed with four parts, like what is used for grafting; then fill the hollow part with it to within two inches of the surface of the ground, treading it in with your foot, or prefilling it in with the hand as close as you possibly can, to prevent the wet from penetrating to the roots, and leave the surface of the composition sloping from the tree towards the outside of the border to throw the wet off, which will prevent the fresh part of the root from rotting; then cover the root over with mould level with the rest of the border;" and, "when you have examined all the old wounds, where large limbs have been cut off, you should next examine the old bark; and if you should find the outer of it wrinkled and cracked, pare it off, as it is always, when in that state, very much hurt by the canker. This should be done with the draw-knife, or other sharp instrument; then apply the composition as before directed, which will bring on a fine smooth bark under it. In the succeeding winter or spring, you will see all the plater with the old part of the bark that was left in the hollow parts of the tree, or where old branches had been amputated, peeling off and showing the smooth bark underneath. You should then scrape off, with a wooden or bone knife, what old bark remains in the hollows where the draw-knife could not reach, without cutting too much away. When that is done, mix up some fresh cow-dung with soap-uds and urine, making it very thin, and give the tree a coat of this mixture all over where the bark has been scraped off; the cow-dung will adhere to it, and beat the parts where you were obliged to scrape to the inner bark. This will wash, he says, remain till the fresh bark comes on; then it will be discharged of itself, during the summer, or the next spring, leaving a new fresh bark where the old and canker was taken off. Next spring, if any of the old bark remains, you may repeat the same operation, which will cause all the remaining old bark to slough off like a scab from a wound of a human body. By these means, he contends, that you will keep your trees in a fine flourishing healthy state, and, in general, prevent them from becoming bark-bound. If any of them, notwithstanding, should be bark-bound, you must fear them, by taking a sharp knife, and running the point of it straight down the middle of the limb from top to bottom, taking care to run your knife through the outer bark only; then, with a brush, or your finger, rub in some of the composition, to prevent the incision from bringing on the canker." [1]

This operation will cause the tree to expand the bark and become very flourishing.

And it is advised to remember to cut off all the ends of the small florets where the canker had injured them last year.

Cut off also the old fruit stalks, and all the small dead flubs, which, if left, will never fail to bring on the canker.

Theough, or canker bark, or that side of trees which is next the wall, should be scraped or pared off with a tool made in the form of a fiddle. "It is much," he says, "to be regretted, that fruit-trees in general, throughout this kingdom, are in a mutilated, unfruitful state. After gentlemen have purchased the young trees from nurseries, and planted them in their orchards and gardens, they think, says he, that every thing necessary is done; when, in fact, the greater part of the work is yet to come. In packing a carriage, the items and branches are very frequently bruised; in that case, the injured parts of the bark and wood must be carefully cut out, and the composition immediately applied; this may be done when you lead the trees, which operation should be performed in April, May, or even June, when the buds begin to flower, but by no means cut off any of the shoots, except those that have broken or braided very much. When this is neglected, the canker will follow to the great injury, if not death, of the trees.

"How common, continues he, is it to see, in all parts of the country, great numbers of trees so affected with this disease, as not to produce fruit enough in twelve or fourteen years to pay half the expense attending them; whereas, if they were to be managed according to the foregoing directions, they would more than pay all the expense in three years. It is common, when young trees do not thrive, either to blame the nursery-men for sending bad or diseased trees, or to attribute their withering state to the nature of the soil; whereas the fact is, that this frequently arises from the inattention or mismanagement of the person who plants and superintends them.

"If the injured and diseased parts be not cut out at an early period, the trees will not thrive, but will become cankered and flouted, and cannot be recovered afterwards without a great deal of labour and trouble; whereas, if the directions given for heading trees the first year, and cutting out the diseased parts, be attended to, the trees will flourish and bear large crops of fine and well-flavoured fruit." [2]

Canker, in Surgery, is a popular name for those small eroding ulcers which take place spontaneously in the cheeks, lips, and gums. This troublesome species of sore is probably connected for the most part with a state of debility in the patient; as it is cured by tonic remedies given internally, accompanied with accentual diet and country air. It is also sometimes useful to touch the ulcer with diluted acids, or a strong solution of alum in water.

Canker, in Veterinary Science, a dreadful disease incident to the feet of horses, and not of unfrequent occurrence, being very troublesome to cure, and of unpleasing appearance, exciting the fame fenations in the mind of horror and dislike, as do the loathsome animals whose names have been applied to it; hence the term cancer or canker, the crab, and the French term crapaud or toad, and in more ancient times lupus or the wolf.

We venture, however, to assert, that there is nothing specifically poisonous generated in the fores of this description, as in the human cancer, though it has been so imagined by many; from having ourselves been frequently inoculated with the secretions from these sores, (as have, no doubt, thousands of others,) without, perhaps, an instance of any contagion arising from it; nor in the cure is there any specific necessity, as in the cancerous, rabid, or venereal poisonous ulcers.

It may be defined, perhaps, as a simple ulceration of the corniferous, or horn-bearing parts of the foot, attended with more or less weaknens of the parts in forming horn, and generally of irritation from the horny edges surrounding the wound, nor in the indications of cure is there any specific necessity, as we have before observed; but the greatest diligence and attention are requisite in destroying those causes of irritation, and in procuring and encouraging the natural
n natural growth of the horn over the exposed parts, which, in old cases, is found difficult enough.

In describing the situation and appearance of this disorder, we may observe, that all parts of the foot that are covered with horn may become the seat of this complaint, and its appearance will vary indefinitely, depending upon the greater or less degrees of weakness of the fore, or irritation from the surrounding horn. The most usual appearance, however, is a light, purfy, fungus, easily bleeding when touched, and rising higher than the edges of the surrounding horn, giving out a thin watery discharge, with a disposition in the ulcer to fcarel and run under the contiguous horn, and if not timely checked, it will extend itself over the whole foot, when the hoof falling off the horse is necessarily lost. On the other hand, where the proper means of correcting this ulceration are used, the contiguous horn is removed, the fungus is reduced, the parts become dry, horn again extends itself over the diffused surface, and the foot becomes as perfect as it was before.

The time often required to correct the morbid disposition in the part itself, and afterwards in procuring the natural growth of the horn, is so truly tedious, as in very bad cases, to make the expenses of keep and care more than over-balance the value of the horse, and it would be to the disadvantage of his proprietor to attempt it; in other cases it is so easily and readily disposed of as to be well worth the time and expense of curing.

The narrative of a case or two will be a more instructive way of describing the treatment of this complaint than any exposition in general terms; and for this purpose we shall select a successful and an unsuccessful case, such as they occurred to us; and here let me remark, in doing that justice, we wish to hold an example of to every one in these matters, that among the shoeing smiths there are many who take great pride in the cure of this disorder, and whose practice, pretty much confined to this object, has rendered very expert; and as much depends on the adroit use of the drawing-knife in removing the horn from the ulcerated parts, they would have vastly the advantage over a young practitio-ner in this respect, though in other respects their treatment should be the same, though these have sometimes failed in bad cases, or the long protracted cure has rendered it of no real advantage to the proprietors. The disease, we may observe, is almost always artificially induced, and may be prevented, which is of vastly more advantage to know than the mode of its cure.

The foot of the horse may be considered as partaking somewhat of the nature of a gland, which is giving out and secreting horn, and whose ulceration will be attended with other phenomena than occur in the ulceration of flesh, or parts of the animal structure, and this peculiarity will render a different treatment necessary.

The following is a statement of the treatment of a successful case of this disorder, with some observations as the case proceeds.

A black draft horse that had been under the care of a shoeing-smith about nine or ten months to be cured, without success, was put under our care in a truly deplorable condition. The sole and frog were almost one extended surface of disease, secreting a white curdy fluid, which was poured out in great abundance about the sides of the frog; this fluid was probably formed of the union of lymph, and the vehicle throwing out imperfect horn which became partially diffused in it; the same appears to be secreted in running streams, and if allowed to remain long on the part, becomes highly fetid.

The edges of the horn encircling the fore were found to be detached, undermined, and black within; these were every where removed by thinning away the horn with a sharp drawing-knife, and when pared to the bone, so that the drawing-knife would no longer lay hold of it, a lancet blade made rather stronger than those usually are for bleeding, and stuck in a handle, was used for thinning away the remaining part, and to diffuse small bits of horn in situations where the drawing-knife would not conveniently reach. This particular process was pursued on every side of the foot which was found to extend to the wall of the foot, and took up a considerable time, the effusion of the heel bone being cautiously avoided, as this would flow over and obscure the parts to be cut. The foot was then smeared over with egyptian, or the cupreous acetate, and honey, boiled together, though we found it equally, or superiorly efficacious for this purpose when made of blue vitriol and treacle, at a much less expense, which may be acceptable information to those who may have to use a large quantity of it: over this dressing, pledges of tow dipped in tar and plentifully soaked with it are laid, till they cover it to a considerable depth. A hollow flute having been previously tacked on by a few nails, an iron plate is fastened under it, and this is fastened in by iron splints between it and the flute, and driven moderately tight with a hammer: similar dressings are applied to the heels and sides of the foot if requisite, and then bound on tight by tar cords. These dressings require to be removed every 48 hours, or when the disease is very virulent, every day: if on removing the dressings they appear tolerably free from mojiture, it is a favourable sign. If the foot reeks, and the dressings appear drenched with perspiration, little or no permanent horn will be found to have formed; if, on the contrary, the parts are doing well, the ulcer will appear almost dry, with a brown scale of horn formed upon its surface, which will generally fell off of itself, if not removed, and be cut removed, and this for several succesive times till the parts acquire the requisite strength for supporting the horn that is formed, which should however be kept as thin as possible for a considerable time, that it may not irritate and exfoliate again. The surface that was undermined, and from whence the horn had been recently removed, will be found the next day to have twisted very much into a fort of more healthy fungus, and on the surface of which, horn will begin to form; this being removed, another layer beneath this takes place, and so on till it reaches the natural foot. By this curious process nature seems to acquire room, and avoids that comprefion from which the immediate formation of horn on the ulcer would occasion. The parts of the face that were subject to irritation may be known by the thin discharge, and the yellow sooty bleeding fungus; and the points of horn irritatig them must be carefully removed to a considerable distance.

The first horn that forms, especially of the sole and frog, readily peels off, and exhibits underneath small white fibres, by which it is adherent; the second cast is more firmly adhered; and in recent cases where the powers of the foot are not weakened, will a here and become perfect horn; but in old cases, it is requisite often to remove it, or thin it down with the knife, and to keep it soft and pliant with tar dressings to prevent irritation and exfoliation.

Some, mixed of egyptian, apply dry powdered verdigris to the sole; others, apply gum of mastic; and some touch the surface with lunar caulis; others, again, use dilute nitrous acid, or marine acid; and some are fond of red lead boiled down, and mixed with the egyptian, as making it more drying; these irritating methods, though of good effect at first, may be carried too far, and do mischief, and weaken the parts too much; it is of more consequence to
to carefully remove all external irritation from the surrounding horn, and the employing of uniform, regular, and strong, but not excructive preservative, which, if adjunually followed with the milder application of tar, are equal to the cure of mallscabs, except such as from long dis ease have become too destroyed and weak, as not to be capable of forming, or afterwards holding horn upon them, or, as is sometimes the case, that the coffin-bone has been injured, and an exfoliating portion of it keeps up the fore, in spite of every endeavour to heal it, till this is removed, as we have met with in two instances. This injury of the coffin-bone may arise from a nail driven by accident out of its course into the side of the foot, and which, entering the bone, splinters and destroys a portion of it; or from the remedies used being of too corrosive nature, or too violent pressure, that shall have destroyed the surface of it, which dying, acts as an extraneous body in preventing the parts from healing; or the horse, from flamping violently on the unprotected bone, from pain or otherwise, shall fracture its thin edges, and thus keeping up an irritation which shall defy every attempt of cure till these are removed, each of which we have seen cafes of in the course of our practice; we may just remark, that where there is an exfoliating portion, it is best to remove it as early as possible, without waiting the tedious process of natural exfoliation: the wound thus formed being then of the nature of a fresh wound, will more readily heal, a practice, we believe, first recommended by that truly great character, Mr. John Hunter.

The above remedies also may be occasionally changed for each other with advantage, as the long continued application of one thing occasions it to lose its effect; and one agrees best with one subject, another with another, for which there can be no rule laid down.

By pursing the above means steadily and uniformly for about nine months, the above tedious and expensive cafe was cured, and every part of the foot covered with horn: the horse was then turned to grass to encourage the more rapid growth of the horn. On his return from grass he was put to work, but suddenly died in a few months after of a liver complaint, which afforded an opportunity we had much sought for of examining the condition of the coffin-bone after a long existence of this complaint upon it, and also whether nature would restore the lost foliated substance of the hoof; and on examination, the foliated horn had been in a great measure repaired, and was growing down quite perfect; having covered two-thirds of the inside of the hoof where the canceler had existed, and where it terminated, there was seen a smooth and cartilaginous surface on the inside of the hoof, and a similar one attached to the foot, so that there was laid in contact with each other without lamina.

The fole which is left organized in its structure than the wall of the hoof, had no perceptible difference from the original fole. If the coronary ring and origin of the lamina had been destroyed, we should in that case doubt the possibility of their reproduction; for in this case, the coronary ring had been cautiously preserved. The coffin-bone had suffered greatly by the disease being considerably diminished on the fole on which the fore had existed, and was become very porous, rough, and uneven; on its upper part near the coronary ring, a rough elevation of bone had been thrown out, of the size of a pea, such as is deposited in splinters and spavins, being whiter and of not so dense a texture as the natural bone. The channel of the artery had also a thin white fissure deposit running to the inside of the heels of the coffin bone, even where no fore had existed.

In the course of the treatment of this disease in different subjects, we have had recourse to many different measures for keeping on the dressings to the foot; among others for this purpose we have made a leather boot, lined on its sides, with a wooden sole, defended at bottom by a thin ring of iron; this boot afforded the requisite pressure, but kept the foot, as we found by experience, too hot and moist, so that the horn was no sooner formed than it again exfoliated.

Flannel bandages were found to be subject to the same inconvenience. Shoes made with small hooks to the fides, palling the hands over the coronet, could not be applied for any length of time, from the skin of the coronet ulcerating from the pressure: we found on the whole nothing fails but the application of pledgets of tow dipped in tar and laid round the foot, (when the fides were affected) with tar. An iron clip turned up from the shoe and palling parallel to the hoof was also found convenient when the fore was not extensive.

The last point is generally by far the most difficult to heal on the side of the foot; it will be found in general to be about opposite the circular artery of the coffin-bone, or its foramen: in the sole the most difficult point is the heel, and the junction of the sides of the frog with the sole: to get at these most conveniently, tow rolled up pretty tight between the hands, then immersed in the dressing, and thrust into the cavity, will be found a convenient way of getting at it; another roll being laid over this, and another till we arrive at the level of the sole, when a general pledget is applied over the whole.

At other times we thought it more convenient and advantageous, in sole cafes, to pass the iron plate under the shoe, and then ram it full by pulling in the dressings through the openings of the heels.

If there be much moisture in the dressings, the cafe rarely goes on well. The plentiful ufe of tar seems to have the power of suppressing, in some manner, this transudation, and cannot be too much attended to, as it serves also to keep the wet from it, if the horse be used on the road.

A dry loose place is better in the cure of this complaint for the hoifes, than standing constantly in one position: a stall, where especially if it be in the hind legs, the blood accumulates with too much force from the declivity of the stall, their position being much lower than the rest of the body.

Exercife, if the lameness is not so great as to forbid it, is much to be recommended, and the occasional ufe of phyfic, especially where the hoifes stand still; a rowel also may be had recourse to with advantage, especially if there be any disposition to greafe.

The frog, we have thought, appeared to be weaker in its powers of forming horn than the sole, and this than the wall; and the first horn is more apt to be undermined and exfoliate from this part, though it may appear fair to the eye: cells containing a white semifluid matter alfo arise under it and that of the fole, and are often the attendant of these exfoliations.

The cooler the foot can be kept, the more progress is made in the cure; therefore, much dressing or much covering is not so well, and water, though highly prejudicial if applied for a constancy, yet may be used to wash the foot with, and afterwards being well wiped dry, the dressings are applied, as we have thought, with good effect. In some cafes, where the fungus rises higher than the horn, and it may be an object to take it off, it will be better to attack the fungus by carefully paring it with a knife till blood appears, and then use the dejectives and preservative; at any rate by
this means, lefs of the horn need be removed, as we get at it closer to the fungus than in the other cafe; and it is always the consequence where it can be done, to save all the horn possible, on account of its flow growth.

In deflecting away the offending points of horn, we have found it useful to observe the rule of beginning in the most depending parts of the foot, that if the blood fluts, it shall not obscure the parts you are next to come to, as it would do if you commenced differently. If inadvertently a vifcl is opened that is troublesome, it is most readily stopped by the point of the cautery, without affecting the other part.

A kind of canker that is truly difficult of cure is the following.—A large draft horse that had occasionally been drest by the lumps for more than a twelvemonth, had a canker of the near hind foot, with the following appearances: the frog was large and fleshy, with a smooth red surface that would form a hard ball of horn, loosely attached and quickly exfoliating; the fole every where bare of horn, having threads or fibres of considerable length, and hardened only at their extremity, their roots being imputed with a white milky secretion. After endeavouring intellectually to harden thaficle into horn, we cut them off with a pair of lafifs, and found that we made more progress upon the disorder: the parts, however, were fo weak, that they appeared unable to retain the horn they had formed, and after several exfoliations of this fort, finding that little ground had been made from the vicious difpofition of the animal, probably made fo by the long pain he had been expofed to, and the time it confafed as well as the aifilation it required, we determined to abandon the cafe. Two or three of fuch cafes have we feen, out of about twenty, some of which have been fealy cured in a few weeks.

Having given some account of the difeafe itself, it will now be right to consider what is its caufe, and if it can be prevented, for we fully concur in the words of Vegetius: (lib. 2. c. 58.) "prehensius concilium eft pedum tueri sanitatem quam passionem curare," preventive means are certainly the most wise, and after fuch a description of this disorder, there is no one, we should apprehend, that would not be anxious to avert it. We confider the moft prevailing caufe of this complaint to be the running thurifh, which firt only affects the cleft of the frog, but becoming aggravatd, it gradually undermines the horn of the frog and spreads to its fides, and from thence to the fole, and fo on to the wall and whole foot.

We remember one cafe where it appeared brought on by the graece, the difcharge from which running down upon the foot, at length destroyed the horn, and brought on canker. Shaving the frog too clofe with the buttcrwifs would occasion this part to dry and crack, and wet getting into the cracks, and lodging there, would rot the frog and induce canker. Any wound of the frog or fole not healing kindly at firft by the blood, fuch as a kennel nail wound, or any other defcription of wound, becoming irritated by the surrounding horn, would form a canker; however, these are rare cafes compared with the one we have mentioned, viz. the running thurifh, the common fource of the michief, which is certainly a confeguence of the frog being fqueezed together by the contraction of the heels, and this again arises from the nailing of an iron thoe permanently to the foot, for an account of which, fee articles, Foot of the horses, and Farriery.

Such is the "brief chronicle" of our present experience in this difeafe, which, though avowedly imperfect, will serve as a more fure baif for receiving the facts of future labourers than the hitherto almost ufeful accounts of this terrible dif-order.

Canker is also a difeafe in dogs, which feizes their ears.

Canker, in hawks, breeds in the throat and tongue, occa-fioned by foul feeding. It is cured by washing the mouth with honey and white wine boiled together, then fhewing it with cheriw-powder.

Canker, black, in Entomology and Husbandry, a species of caterpillar, which has been occasionally deftructive, in a very great degree, to the crops of turnips in Norfolk. The farmers in that county, obferving great numbers of yellow flies among the turnips, previously to the appearance of these caterpillars, have been led to conclude, that the canker was the caterpillar flate of the yellow fly; and from their frequent appearance on the eastern face-coal it has been inferred, that they are not natives of this country, but that they come hither across the ocean. Their deftructive ravages, however, have not been confined within a few miles of the eastern coal; but they have extended more or lefs into the centre of the county. From the description which Mr. Marshall has given of them, it appears that they have four wings; that their antenna are clubbed, and about one-third the length of the body, each being composed of nine joints; and that near the point of the tail of the female there is a black speck outwardly fringed with hair, but which, opening longitudinally, appears to be the end of a cafe containing a ring, about one-twentieth of an inch in length, which, on agitation, separates into three one-edged iftruments, with a spiral line or wrinkle winding from the points to the haie, making ten or twelve revolutions, and giving them the appear-ance of being ferrated. By means of these iftruments, the female is supposed to deposite her eggs in the edge of the turnip leaf, or sometimes in the nerves or ribs on its under surface. The caterpillar has twenty feet (fix of its legs being considerably long, and the other fourteen very short); and in its first age is of a jet black, deftitute of hair, but covered with innumerable wrinkles. Having attained its full size, it fixes its hinder parts firmly to the leaf of a turnip, or other substance, and breaking its outer coat or flough near the head, crawls out, leaving the skin fixed to the leaf, &c. The under coat, which now appears, is of a blufh or lead colour. The caterpillar in this flate continues to feed on the turnips for fome days longer; it then altogether defifts from eating, and becomes covered with a dewy moisture which feems to exude from it in great abundance, and which, being of a gluttonous nature, appears to form its chryafis cofit. Mr. Marshall concludes from the genuine characters of the fly, that it is tenthrade of Hill. See Tenthrado and Turnip. Phil. Tranf. vol. 73. p. 227, &c.

CANA, in Betony, (Heb. צנה) Kane, a reed, whence our English word Cane is indi{pensably derived. "Kana" is interpreted in the Greek Lexicon λάνης, a mat, or according to Hefychius, the plant of which mats are made. It is larger than arundo and lefs than calamus,) Linn. Gen. r. Schreb. 1. Wild. 1. Gert. 41. Juff. 63. Vent. 2. 203. (Cannacus, Tourn. 102.) Indian flowering reed, or Indian Scott. Balifher, Fr. Cais and order, monandria monagynia. Nat. Ord. fcitihmone, Linn. canae, Juff. drymyrrhæa, Vent. Gen. Ch. Col. Perianth three-leaved, permanent; leaves lanceolate, erect. Cor. Monopetalous, five-cleft (eight-cleft; Salib.) three outer segments erect, larger than the calyx; three inner segments larger than the outer ones, two erect, one revolute, forming a kind of lip. Stem. Filament referring a petal, two-cleft; upper segment erect, bearing the anther; lower one revolute; anther linear, adhering to the edge of the upper segment of the filament. Phj. Germ. inferior,
Stems di(h« $ may place bling i dry Salisbury •

Leaves flower hot-bed Katu-ala C. p. Gceit. 1 fileui latif. phyllus year, late, come from not fibre long and shorter plant, the inner one longer and narrower, often spreading and narrowed; calyx-leaves unequal, entire, obtuse; tube of the corolla much longer than the calyx, a little recurved; outer border a little longer than the tube, abruptly reflexed, deeply three-cleft; segments unequal, linear-lanceolate, entire, obtuse; inner border longer than the outer one, deeply three-cleft, segments thinner, blunted, much curved at the edges, the outer ones narrow, and nearly closed, the inner ones (segments of the corolla, Linn. Sec.) broad, involute, egg-shaped, emarginated: anther white, adhering to the edge of the inner side of the innominate segment, upright, linear, very remotely pointed, two-celled, opening in front; germ pale-green, outer, minutely tubercled: hyde very pale yellow, linien-egg-shaped, smooth on both sides, flat; Filicis white, slightly pubescent. Pericarp and seeds similar to those of the other species. Salisbury. A native of South Carolina, where it was found by Bartram. It is often mistaken for C. glauca.

PROPAGATION AND CULTURE. All the species are perennial, and with proper management will continue many years; but as young plants always flower better than old roots, it is best to raise them annually from seeds which should be sown in a hot-bed in the spring. When the plants are fit to remove, they should be transplanted into separate small pots, filled with rich kitchen garden earth, and plunged into a moderate hot-bed of tanagers-bark. In warm weather they should be supplied with fresh air every day and frequently watered. As they soon grow large, they should be shifted into larger pots, and part of them plunged into the same hot-bed; the rest may be placed abroad in June in a warm situation with other exotic plants. Those which are placed in the hot-bed will be strong enough to flower well in the flower in the following winter; but those in the open air will not flower before the following summer. In the beginning of October, they must be removed into the floor. The variety $ of C. indica, which is a native of Carolina and some of the other northern states of America, being harder, should be more early enured to the open air, where it may remain till the frosts begin. It should be then removed to the green house, and during the winter should have but little water. In the beginning of May it may be turned out of the pot, and planted in a dry soil on a warm south border, where it will produce flowers annually. Miller.

Canna, in Commerce. See Cane.

Canna, in Ancient Geography, a small town of Asia Minor, in the Eolid: Mel.—Also, a town of Cappadocia, in Lydia. Potency,—Also, a place of Asia, between Cyra and Edeia. Anton. Itin.

CANNABA, a place of Asia, in Syria, upon the route from Nicopolis to Ecdesia. Anton. Itin.

CANNABICH, in Biography, a spirited and masterly composer of symphonies of the Mannheim school, contemporary with Stamitz and Holzblat, about the middle of the last century. He was the most eminent solo player on the violin of his time: and his ballet of the descent of Hercules into the infernal regions, is a most beautiful production.
Cannabis, (corolla, Linn.) Superior, coloured; divided into several, often lis, petal-shaped, generally unequal and irregular segments; with three others exterior and smaller, putting on the appearance of an external calyx, (the proper calyx, Linn.) Stem one; filament inserted into the base of the style, often flat and petal-shaped; anther adhering, simple, or rarely double. Germ inferior; style simple, often thread-shaped; stigma simple or divided. Capsule inferior, three-celled, most frequently three-valved, and many-seeded. Root often tuberos, creeping. Stem herbaceous, covered with the feathering petales. Leaves alternate, feathery, younger ones convolute, fomemany-nerved, others spreading out parallel nerves from each side of a simple midrib. Flowers in fputhes, often growing on a cauline, or radical fpath. The genera figned to this order by Jullieu are catibium, canna, glloba, myrolma, anomum, colus, alpinia, maranta, thalia, curcuma, and kempferia.

Cannabina, in Botany, (foio tripartitum diviio. C. Bbuh. pis. 321.) See Bibles Tripartita. Cannabina, (foliob non diviio, ibid.) See B. Cerrna. Cannabina, (indica. Magn. Hort. 40. tab. 40.) See Versinia Alata. Cannabina, Tourn. Cor. 52. tab. 488. See Datisca Cannabina. Cannabis, (corona, Herod. Dioscor.) It is not mentioned by Theophrastus. Linn. gen. 1115. Schreb. 1532. Gart. 463. tab. 75. fig. 1. Tourn. Imil. 515. tab. 369. Jull. 404. Vent. vol. ii. 536. Clafs and Order, delta pectinata. Nat. Ord. Scabriis, Linn. Urius, Jull. Gen. Ch. Male. Cal. perianth five-claret; segment oblong, acuminate obtuse, concave. Cor. none. Stam. filaments five, capillary, very short; anthers oblong, four-cornered. Female. Cal. perianth one-leaved, oblong, acuminate; opening longitudinally on one side, permanent. Cor. none. Pyl. germin very small; flyle two, very long; stigma acute. Pericarp the permanent calyx closely covering the seed. Sood, nut globular, depressed, two-valved. Eff. Ch. Male. Calyx five-claret; corolla none. Female. Calyx one-leaved, entire, opening on one side; corolla none; flyles two; nut two-valved, within the closed calyx. Sp. i. C. fatua. Linn. Sp. Pl. Mil. fig. tab. 77. Bauh. Hift. i. fig. 448. Ger. Eemac. 708. fig. 1. 2. Lam. Ill. Pl. 814. Hemp. Chianvre. Fr. “Leaves opposite.” Root annual. Stem from fix to eight feet high or more, upright, obscurely quadrangular, a little hairy. Leaves petioled, digitate; leaflets five or seven, lanceolate, acuminate, ferrated, outer ones the small. Male flowers in small loose racemes or spikes at the ends of the stem and branches. Female flowers, axillary, solitary, very small. Both kinds sometimes occur on the same plant, but always one of them very few in proportion to the other. All the old authors ignorantly call the male flowers female, and vice versa. It is said by Herodotus to be a native of Scythia. According to Linnaeus it grows wild in the East Indies. Thunberg says it grows here and there in Japan. Genlin found it in Tartary, and Father Hemepin among the Illinois, in North America. From long cultivation it is almost naturalized in the four of France, Italy, etc. An oil is extracted from its seeds. The seeds themselves are thought to be good for poultry, and to cause hens to lay a larger quantity of eggs, but should be given to smaller birds with caution, and milled with other seeds. It has been said, that if bullfiches and goldfiches feed upon them too plentifully, the red and yellow of their plumage is changed to a total blackness. For the propagation and culture of this plant, the various processes which it undergoes in the hands of the manufacturer, and the uses to which it is applied, see Hemp. 2. C. indica. Lam. Encyc. (C. simis exotic, Bauh. piz. 320. C. peregrina, Murif. Hift. iii. p. 433. n. 2. Kalengi-Cansjava, Rhed. Mal. 10. p. 119. tab. 60. Tjern-Cansjava, Ibid. tab. 61. Dakka or Bangua of the Indians. B. With a taller stem. Rumph. Amb. v. p. 208. tab. 77. “Leaves alternate.” Stem nearly cylindrical, smaller, more branched, and harder than that of the preceding species. Leaves all conflantly alternate; leaflets linear-lanceolate, very sharp-pointed; in the male plants five or seven, in the female ones commonly but three, on a petiole; near the top entirely simple. A native of the East Indies. Its hard stem and thin bark render it incapable of being wrought into filaments and fpun like common hemp. It has a strong smell, a little like that of tobacco. The Indians make of its bark and the expressed juice of its leaves and seeds, a liquor which has an intoxicating quality: and if they wish to produce a stronger effect, they either chew or smoke its dried leaves mingled with tobacco. A little nutmeg, cloves, camphor, and opium, mixed with its juice, form the composition which the Indians call majet, and which, according to Clusius, is the same as the malach of the Turks.

Cannabis Spuria, (Riv. Mon. tab. 32.) See Galeopsis Versicolor.


Cannacus. See Cannia.

Cannia, in Ancient Geography, a small town of Italy, in Apulia, feated on the river Aufidus, now called Ofanto. The Latins use the plural appellation for this city, probably from its confiding of distinct parts, built on different eminences. The Greeks, and Polybius in particular, called it Kanoe, in the fingular number. This place has been rendered famous in hisory by the battle fought in its vicinity between the Carthaginians and the Romans, in the year of Rome 538, B. C. 216. For some time previous to this battle, Hannibal, the Carthaginian general, had, by various movements and skirmishes, endeavoured to bring Fabius, the wife and wary Roman dictator, to a decisive contest. He well knew that inaction and delay were the principal evils he had to fear, and the diftreas occasioned by want of provisions and money made him anxious to provoke the Romans to an engagement. Fabius, on the other hand, duly apprized of the situation of his adversary, adopted every prudent meafure for protracting the war, and ruining his enemy by delay. Some trivial succfces which were gained by the Romans in their encounters with the Carthaginians, increased the confidence both of the army and of the people; and forgetting their former defeats, they began to imagine that the enemy maintained his fation in Italy, by the permission, by the timidity, or by the excefsive caution of their leader. Miniusit, the general of the horfe, having also, in the abfence of the dictator, obtained some flight advantage over the foraging parties of Hannibal, the army and the people were confirmed in this opinion, and the reputation of Fabius was greatly funk in their efimation. But as he could not be superfed after the ufual term of his office expired, the Senate and people adopted a meafure, which they hoped would induce him to reign. They raised the general of the horfe to an equal
equal command with the dictator, and left them to adjust their respective pretensions. The Roman dictator, instead of rashly and indignantly withdrawing his services in a moment of danger, continued to serve under this diminution of rank and command, and magnanimously overlooked the inuits with which the people had required the service he was rendering to his country. Mummintius being now associated with the dictator, in order to be free from the restraint of a joint command, and from the wary counsels of his colleague, defined, as the more proper mode of adjusting their pretensions, to divide the army between them. In this new situation he exposed himself and his division, by his intimates, to the danger of being entirely cut off by the enemy; but being relented by Fabius, he acknowledged the favour he had received, and committing himself, with the whole army, to the conduct of his colleague, he left this cautious officer, during the remaining period of their joint command, to pursue the plan which he had formed for the war, and to which, without overbearing interference, he determined to adhere. The people, and the senate, however, were not disposed to acquiesce in what they conceived to be the hazardous and dilatory measures which Fabius was inclined to pursue. Having resolved to augment the army in Italy to eight legions, which, with an equal number of the allies, amounted to 80,000 foot and 7000 horse, which they conceived would be a force more than sufficient to counteract that of the Carthaginians, which consisted of 40,000 foot, and 10,000 horse; they intended, on occasion of the approaching election of consuls, to chuse men, not only of reputed ability, but of decisive and resolute counsels. Accordingly, they elected C. Terentius Varro, supposed to be of a bold and dauntless spirit; and, with a view of tempering his ardour, they joined with him in the command L. Æmilius Paulus, an officer of approved experience, who had formerly obtained a triumph for his victories in Illyricum, and who stood high in the confidence of the senate, as well as in that of the people.

The autumn before the nomination of these officers to the command of the Roman army, Hannibal had surprized the fortresses of Cannae, whether the Roman citizens of that quarter had retired with their effects, and where they had collected considerable magazines and stores. This, among other circumstances, determined the senate to hazard a battle, and to furnish the new consuls with instructions to this effect. These officers, having opened the campaign on the banks of the Aufidus, advanced by mutual concert within six miles of the Carthaginian camp, which covered the town of Cannae. Here they differed in their opinions; and a compromise was made by an agreement, that each of them should alternately take the command for a day. Varro, in opposition to the sentiments of his colleague, proposed to give battle on the plain, and for this purpose, as often as the command devolved upon him, still advanced on the enemy. In order to occupy the passage and both sides of the Aufidus, he encamped in two separate divisions on its opposite banks, having his larger division on the river, opposed to Hannibal's camp. Still taking the opportunity of his turn to command the army, he passes with the larger division to a plain, supposing to be on the left of the Aufidus, where, as the field was too confined to receive the legions in their usual form, he pressed them together, and gave the enemy, if he chose it, an opportunity to engage. For the accommodation of his order to the extent of his ground, he contracted the head, and the intervals of his maniples or columns, making their depth greatly to exceed the front which they turned to the enemy. He placed his cavalry on the flanks, the Roman knights on his right towards the river, and the horsemen of the allies on the left. Varro, having thus arranged his forces, and impelled by vanity, in consequence of having obtained some slight advantages by skirmishes between the light horse, or dispirited by an insult of the Numidians, who had pursued a body of Romans almost to the gates of the camp, determined to bring the contest to a speedy conclusion. Paulus Æmilius disapproved of the place which he had chosen for the scene of battle, but willingly to draw the enemy to a situation, where the infantry, in the number of which they exceeded, might have the greater share in the action, whereas Hannibal's cavalry was in every respect superior to that of the Romans; and remonstrated against the precipitance of his colleague. Paulus Æmilius commanded the right of the Romans, Varro the left, and Servilius Cemenus, the confid of the preceding year, was in the centre. Hannibal, as soon as he saw the movement and disposition of the enemy, hastened to meet them on the plain which they had chosen for the field of action. He likewise passed the Aufidus, and with his left to the river and his front to the south, formed his army up in an equal line with that of the enemy. He placed the Gaulish and Spanish cavalry on his left facing the Roman knights, and the Numidians on his right facing the allies. The flanks of his infantry, on the right and the left, were composed of the African foot, armed in the Roman manner, with the pilum, the heavy buckler, and the stabbing sword. His centre, though opposed to the select portion of the Roman legions, consisted of the Gaulish and the Spanish foot, variously armed and intermixed together. Astitribus commanded the left, Hanno the right, and Hannibal with his brother referred the command of the centre to himself. As the armies formed north and south, even the fun, which rofe soon after they were formed, shone upon the flanks, and was no disadvantage to either of them. Some difficulty has occurred in deciding which way each of these armies was turned; as the expressions of Polybius are said by some to admit of a double meaning. His words are "Βλεπωντος ὁ της ἔν τον Ρωμαίων τάξιν προς μεταβείναι τὸν ἐν τῷ Καρθαγίνιων ἐπὶ τοῦ αὐχένος ἐνεργὴν αἴθανον συμβαινειν γινώσκειν τῷ καθ' ἀυτὸν αναφαίνειν." Spectante meridic Romanorum aequi, Carthaginensium vero septentrionem, ambobus inoffensis contigit efl' ab folis ortu. Livy is charged by Chaupry with having misconstrued the passage of the Greek historian, who, according to his opinion, did not mean, that the Romans foold with their faces to the noon-tide fun; but only that they were drawn up to the south of the enemy. Livy's words are (lib. xxii. 46), "Romani in meridiani, Parni in septentrionem verba." He affirms, moreover, that the topography of the plain, and the course of the river, agree with this explanation; and that if the legions had faced the south, the runaways could not, after the defeat, have reached Canusium and Vcnulia, without passing through the whole victorious army. Salapia, Arpi, and Lucceria, would have been their places of refuge. Sminburne inclines to truft to the explanation of Livy, who was sufficiently acquainted with the Greek language not to mistake the meaning of an author whom he studied and followed to closely; more especially as, according to his ideas, the situation of the ground is in favour of the Roman historian; for exactly in that part of the plain where we know with moral certainty that the main effort of the battle lay, the Aufidus, after running due east for some time, makes a sudden turn to the south, and describes a very large semicircle. The Romans, we are to suppose, fought it at the angle or elbow, and placed their right wing on the banks; while the legions extended themselves
selves due call, till the whole line came to face the north. The Carthaginians crossed in two places within the semi-circle; and were drawn out in a line, that formed the chord of which the river was the arch; and therefore the way to Cannanum was open for the fugitives. Swinburne adds, that the scene of action is marked out to posterity by the name of "Pezzo di Sangue," or field of blood. The peafants, he says, threw us some spurs and heads of lances lately turned up by the plough, and told us, that horse-loads of armour and weapons had been at different times carried away from thence. Livy (I. xxii. 12.) and Plutarch (in Fab. p. 183.) inform us, that Hannibal, who knew how to avail himself of circumstances, as a great captain, forgot nothing that could conduce to the victory. A wind peculiar to that region, called in the country the "Vulturus," blew always at a certain period. He took care to draw up in such a manner, that his army, facing the north, had in its backs, and the enemy, fronting the south, had in its faces; so that he was not in the least injured by it: whereas the Romans, whose eyes it filled with dust, scarcely saw before them. The superiority of numbers was greatly on the side of the Romans; but Hannibal refited his hopes of victory on two circumstances: first, on a motion to be made by his cavalry, if they prevailed on either of the enemy's wings; next, on a position he was to take with his centre, in order to begin the action from thence, to bring the Roman legions into some disorder, and expose them, under that disadvantage, to the attack which he was prepared to make with his veterans on both their flanks. The action accordingly began with a charge of the Gaulish and Spanish horse, who, being superior to the Roman knights, drove them from their ground, forced them into the river, and put the greater part of them to the sword. By this event the flank of the Roman army, which might have been joined to the Aedus, was entirely uncovered. Having performed this service, the victorious cavalry had orders to wheel at full gallop round the rear of their own army, and to join the Numidian horse on their right, who were still engaged with the Roman allies. By this unexpected junction, the left wing of the Roman army was likewise put to flight, and pursued by the African horse; at the same time the Spanish cavalry prepared to attack the Roman infantry, wherever they should be ordered on the flank, or the rear. While these important events took place on the wings, Hannibal caused the Roman legions of the main body, with a singular movement that was made by the Gauls and Spaniards, and with which he proposed to begin the action. These came forward, not in a straight line abreast, but swelling out to a curve in the centre, without disjoining their flanks from the African infantry, who remained firm on their ground. By this motion, they formed a kind of crescent convex to the front. The Roman maniples of the right and the left, fearing by this singular disposition to have no share in the action, hastened to bend their line into a corresponding curve; and, in proportion as they came to clofe with the enemy, charged them with a confident and impetuous courage. The Gauls and Spaniards refited this charge no longer than was necessary to weaken the precipitate ardour with which victorious troops often blindly pursue a flying enemy. And the Roman line being bent, and fronting inwards to the centre of its concave, the legions pursued where the enemy led them. Hurrying from the flanks to share in the victory, they narrowed their space as they advanced, and the men who were accustomed to have a square of six feet clear for wielding their arm, being now pressed together, fo as entirely to prevent the use of their swords, found themselves struggling against each other for space, in an inextricable and hopeless confusion. Hannibal, who had waited for this event, ordered a general charge of his cavalry on the rear of the Roman legions, and at the same time an attack from his African infantry on both their flanks: by these dispositions and joint operations, without any considerate loss to himself, he effected an almost incredible slaughter of his enemies. With the loss of no more than 4,000 Gauls, 1,500 Spaniards and Africans, and 200 horses, he put 70,000 of the Romans to the sword. Polybius says the general loss amounted to more than 70,000. The Carthaginians were so furious against the enemy that they did not cease killing till Hannibal, in the greatest heat of the conflict and slaughter, exclaimed several times, "Hold, soldiers, spare the vanquished." The consul Aemilius Paulus had been wounded in the shock of the cavalry; but when he saw the condition in which the infantry were engaged, he refused to be carried off, and was slain. "I have taken my resolution," said he. "I will expire upon these heaps of my dead soldiers; but do you take care not to lose the time you have for escaping from the enemy, through an useless comparison. Go, and tell the senate from me to fortify Rome, and to make troops to enter it for its defence, before the victor arrives to attack it. Tell Fabius in particular, that I lived and died highly sensible and fully convinced of the wisdom of his counsels." The confusion of the preceding year, with others of the same rank, were likewise killed: of 6000 horses only 70 troopers escaped with Varro. Of the infantry, 3000, or according to other accounts, 4000, fled from the carnage that took place on the field of battle, and 10,000, who had been posted to guard the camp, were taken; others retired to Cannanum. The unfortunate confus with much of the fraggler as joined him in his retreat, took poff at Venaue, and afterwards at Cannanum, where he joined a considerable number of those that had escaped; and with a noble confidence in his own integrity, and in the resources of his country, put himself in a posture to refit the enemy, till he obtained further instructions and reinforcements from Rome. On his return to the city, the senate, confident that he had taken at Cannen by their own instructions, and, that influenced by the motives that animated the whole Roman people, he had disjoined, with a superior army, to fling in face of his enemy, or to refute him battle upon battle, but, on arriving, found that the enemy, after many losses, was in a kind of preceffion to meet him; and overlooking his temerity and misconduct in the action, they attended only to the undaunted aspect which he preferred after his defeat, and returned him thanks for not having despared of the commonwealth. From this time they continued their preparations for war with all the dignity and pride of the most prosperous fortune. They refused to ransom the prisoners who had been taken by the enemy at Cannic, and treated with fallen contempt, rather than severity, those who by an early flight had escaped from the field; and when they were petitioned to employ them again in the war, they replied, "we have no service for men who could leave their fellow-citizens engaged with an enemy." On the part of Hannibal, this victory was complete; but his subsequent inactivity saved Rome and her dominions. Many, and Livy amongst the rest, condemn Hannibal for his delay in improving this signal success, as a capital error. But others, restrained by the authority, or rather the silence of Polybius, have forbore from cenfuring the conduct of the Carthaginian general. He allows, indeed, that the Carthaginians entertained hopes of carrying Rome on the first assault;
affault; but he does not explicitly declare his own opinion concerning the measures which might have been prosecuted in respect to a city very populous, extremely warlike, well fortified, and defended by a garrison of two legions. He does not so much as intimate that such a project was practicable, or that Hannibal was to be blamed for not having attempted it. It should be considered, that after the battle he had not more than 20 or 27 thousand foot, who were in a condition to act; and that number could not suffice either for forming the circumference of a city of such extent as Rome, with a river running through it, or for attacking it in form, without machines and other implements necessary in a siege. The victory at Cannae afforded to Hannibal a very considerable booty: but except men, horses, and a little silver which was principally upon the furniture of the horses, he abandoned all the rest to the soldiers. After the battle of Cannae, Hannibal took up his winter quarters at Capua, which fee. Polyb. iii. 262-267-298. Livy, xxii. 43-44-45-46. Plut. in Fab. 182-183. Rollin's Anc. Hist. vol. i. Rollin's Rom. Hist. vol. iii.

The plains on which the battle of Cannae was fought, have more than once, since the Punic war, afforded a scene of warfare and blood. Mela of Bari, after raking the Standard of revolt against the Greek emperors, and defeating their generals in several engagements, was at last routed here, in 1019, by the catapax Balanus. Out of 250 Norman adventurers, the flower of Mela's army, no more than ten escaped the slaughter of the day. In 1201, the archbishop of Plermo and his rebellious associates, who had taken advantage of the monasticism of Frederick of Swabia, were cut to pieces at Cannae by Walter de Brienne, sent by the pope to defend the young king's dominions. The remaining traces of the town of Cannae are very faint: and coffin of fragments of altars, cornices, gates, walls, vaults, and underground granaries. It was destroyed, as we have already observed, the year before the battle; but being rebuilt, it became an episcopal fee in the infancy of Christianity. It was again reduced in the 6th century; but seems to have fulfilled in an humble state many ages later; for we read of its contending with Barletta for the territory which till that time had been enjoyed in common by them; and in 1264, Charles the first issued an edict for dividing the lands to prevent all future litigation. The prosperity of the towns along the coast, which increased in wealth and population by embarkations for the crusades, and by traffic, accelerated the annihilation of the inland cities; and Cannae was probably abandoned entirely before the end of the 13th century. It is now an incendible place, with a titular ice, in the country of Bari. Swinburne's Travels, etc. vol. i.

CANNAGARA, a town of India, placed by Ptolemy on the other side of the Ganges.

CANNAR, or CANNATUS, a promontory of Africa, in the Mediterranean Sea, in Mauritania Tingitana, according to the Itinerary of Antonine.

CANNARES, Indians of the province of Quito, in Peru. They are well made and very active; they wear their hair long, which they weave and bind about their heads, in form of a crown. Their clothes are made of wool or cotton, and they wear fine-fashioned boots. Their women are handsome and fond of the Spaniards; they generally till and manure the ground, whilst their husbands at home card, spin, and weave wool and cotton. Their country had many rich gold mines, which have been drained by the Spaniards. The land bears good wheat and barley, and has fine vineyards. The magnificent palace of "Theomabamba" was situated in the country of the Canares.

CANNAROLA, in Ornithology, the name applied by Aldrovandus to the babbling warbler, Mopailla Canara of Linnaeus.

CANNAVERAL, Cape, in Geography, the extreme point of rocks on the east side of the peninsula of East Florida, having the Mosquito inlet N. by W. and a large island S. by E. This was the boundary of Carolina by charter of Charles I. N. lat. 28° 55'. W. long. 81° 9'.

CANNAYAH, a village of the north side of Washington island, on the N.W. coast of North America.

CANNEL-COAL. See Coal.

CANNELS, in Zoology, a species of biped reptiles in the arrangement of De la Cépée, in the first volume of his "History of opifarious Quadrupeds and Serpents." The other species of this genus is the heliotopis, described by Pallis in the Petersburg Transactions.

The cancell is an animal lately discovered in Mexico by M. Velazques, and brought into France by the vicomtes de Fontanges. Its whole length is 8½ inches, and its diameter the third of an inch; the abdominal semi-rings are 150, and the tail-rings 45; the thickness of the whole body is nearly equal; the legs, one-third of an inch long, are close to the neck, and the feet each four toes furnished with nails. The cancell seems to have a near resemblance to the amphibious of Linnaeus, and perhaps, when it is better known, it may be found to belong to that genus; though, at the same time, the legs justify the genus as established by the count de la Cépée.

CANNIOQUINS, in Commerce, white cotton cloths brought from the East Indies. They are a proper commodity for trading on the coast of Guinea, particularly about the rivers Senegal and Gambia. These cloths are folded fquare-wise, and are about eight ells long.

Cannes, in Geography, a small town and harbour of France, in the department of the Var, and district of Grasse, which gives name to a bay formed by Cape Garap or Graspe. N. lat. 43° 54'. E. long. 7° 7'.

CANNESI, a town of Louisiana, on the north bank of Red River, a branch of the Mississippi.

CANNETE, a town of Spain, in the province of Cordova; 18 miles E. of Cordova.—Also, a town of Spain, in the province of Seville; 5 leagues S. of Olmo.

CANNETS, Fr. in Heraldry, ducks represented without beaks or feet. Cannets have their heads in profile, and they differ from Allerions, which are always displayed and full-faced, and they have longer and more encircling necks than those of the martlets.

CANNETTE, in Geography. See Cagnete.

CANNIA, a place in the island of Ceylon, about six miles from the fort of Trincomalee on the road to Candy, famous for its springs, the waters of which are reckoned very efficacious in rheumatic complaints. The springs are fixed in number, and of different degrees of heat; they all communicate with one another, and exhibit the same phenomena. Their heat varies from 98° to 106° of Fahrenheit's thermometer, nearly in proportion to their different depths. From an analysis of these waters it appears that they possess few mineral qualities, or perhaps any virtue besides their heat, which is of a temperature not unfavourable for hot bathing. Percival's Ceylon, p. 360.

CANNIBAL, or Canibal, is used by modern writers for anthropophagus, or man-eater, more especially of the West Indies. See Anthropophagi.

In the ancient world, tradition has preferred the memory of barbarous nations of cannibals, who fed on human flesh, and in every part of the new world there were people to whom
whom this custom was familiar. It prevailed in the southern continent in several of the islands (See Caribbean), and in various districts of North America. Even in some parts where the practice has been abolished, it seems formerly to have been so well known, that it is incorporated into the idiom of their language. Among the Iroquois, the phrase by which they express their resolution of making war against an enemy is "Let us go and eat that nation." If they solicit the aid of a neighbouring tribe, they invite it to eat broth made of the flesh of their enemies." Nor was this practice peculiar to rude unpolished tribes: the principle from which it took rise is so deeply rooted in the minds of the Americans, that it inflamed in Mexico, one of the civilized empires of the new world, and relics of it may be discovered among the more mild inhabitants of Peru. It was not scarcity of food, as some authors imagine, and the importunate cravings of hunger, which forced the Americans to these horrid repasts on their fellow-creatures. Human flesh was never used as common food in any country. It was the rancour of revenge that first prompted men to this barbarous action. The fierce tribes seldom devoured any but prisoners taken in war, or such as they regarded as enemies.

This fact is confirmed by two remarkable circumstances, which occurred in the conquest of different provinces. In the expedition of Narvaez into Florida, in 1528, the Spaniards were reduced to such extreme distress by famine, that in order to preserve their own lives, they ate such of their companions as happened to die; this appeared so shocking to the natives, who were accustomed to devour none but prisoners, that it filled them with horror and indignation against the Spaniards. During the siege of Mexico also, though the Mexicans devoured with greediness the Spaniards and Tlapecalans, whom they took prisoners, the utmost rigour of the famine which they suffered could not induce them to touch the dead bodies of their own countrymen. The authorities for these facts are cited in Dr. Robertson's Hist. of America, vol. ii. p. 501. See Anthropphagi. See also the articles America, Anisko, Battia, Suckinam, and New Zealand.

Cannon, or Cannon-flame, a base sort of iron-ore, in the Staffordshire mines, of which the want metal is made.

Cannon, in French canon, from the Italian word canna, which is derivable from the Greek word καννής, signifying the beam of a lieedryard or balance, a reed, cane, rod, or ruler, &c.; or from κάννα, in Latin canna, a cane, reed, fugar-cane, pipe, &c. This word, in its general acceptance, is applied not only to large guns, howitzers, mortars, caronades, &c. and all heavy pieces of ordnance or artillery, but also to the barrels of all smaller fixed fire-arms, such as muskets, carabines, fusces, pistols, &c. whether the bores of the flame be smooth on the inside or rifled. In its more restricted and ordinary acceptance, however, it is made use of to express a large-sized fire-arm, a piece of ordnance or artillery, a warlike engine, machine, or instrument for projecting or throwing balls, bullets, shells, grape-shot, flones, &c. &c. by means of gunpowder. It has a cylindrical bore or tube running lengthwise in the middle of it from the muzzle towards the breech for receiving the charges of powder, shot, shells, &c. After gunpowder began to be applied to military purposes, it supplanted and succeeded the tormenta bellica, or warlike machines of the ancients. The first cannons were called bombardes, from βολής or "a bombo et ardore," on account of the great noise, which the firing of them occasioned; and as they succeeded to these machines, they were employed like them for throwing large stones, and had prodigious calibers. Their forms, as well as the engines and instruments made use of in managing, moving, and conducting them, were only such as the most obvious incidents forward, or the rudest and most uncultivated invention dictated. They usually consisted of bars or pieces of iron fitted, and sometimes folded together lengthwise, and hooped with iron rings. Being long beyond all just or due proportion, they were heavy, clumsy, and in a great degree unmanageable; and as they were used for throwing stones, like the machines they succeeded, they were necessarily of a huge or enormous bore, and could not be fired but at great intervals of time. Such were those with which we are told Hannibal, in his march against the Carthaginians, order a battery of waggons, hooped with iron rings, of a length of 1200 feet. Though some use has been made of guns in Europe upwards of a century before, so little improvement had been made in their construction that they could not be fired above three or four times a day, or discharged often without bursting. And Guicciardini, in the first book of his history, informs us, that so great a portion of time intervened between the different discharges and discharges of one of those ponderous and unwieldy pieces, that the baggage had sufficient time to repair at their leisure the breaches made in their walls by the shock of the huge and enormous stones, that were thrown from them. For a considerable time indeed, after men began to apply gunpowder to military purposes, their guns were very long, heavy, and unmanageable, and of course very unfit for quick or expedient service. Military people at that time poffessed but a small share of learning of any kind, and almost none at all of a mechanical or mathematical nature. What they did professionally in regard to the management of artillery was entirely the effect of practice and a bare repetition of what they saw every day done.

But as mathematical knowledge increased in Europe, that of mechanics gradually advanced, and enabled artists by making both brass and iron cannon of a much smaller bore for receiving iron bullets, and a much greater charge of strong powder in proportion to their calibers, to produce a very material and important change in the construction and fabric of those original pieces. Accordingly this historian, in the same work of his history, informs us, that about 141 years after the first use made of those ponderous and unwieldy pieces by the Venetians, in the war which they carried on against the Genoese in the year 1380, the French were able to procure for the invasion of Italy a great number of brass cannon, mounted on carriages, drawn by horses instead of oxen; and that these pieces could always keep pace with the army.

In enumerating the advantages, which arose from this alteration in the structure and management of artillery, he observes, that the pieces were pointed with incredible quickness and expedition in comparison of those formerly made use of in Italy, were fired at very small intervals of time, and could produce in a few hours an effect, which those others could not have produced in the space of many days. In speaking of these matters he uses the following words:

"Et par uneri con quellerc exercito erano flato condotte per mare a Genova quantità grande d'artiglieria da battere le muraglie et da ufare in campagna, ma di tal forte, giannma non havava veduta Italia le semignanti. Quella pestre trovata molt anni innanzi in Germania fu condotta la prima volta in Italia da Venetiani nella guerra, che circa l'anno della falute 1380 hebbono i Genoeci con loro—il nome delle maggiori era bombarder, le quali, sparando dopo qualunque inventione per tutta Italia s'adoperavano nell' oppugnazioni delle terre, alcune di ferro, alcune di bronzo ma grof-
fistime, in modo che per la machina grande et per l'im- 
pertuta de gli uomini e mala attitudine de gli instrumenti 
tardifarnemente et con grandissima difficilta si conduccevano, 
piantavano alle terre co' medesimi impedimenti e piante 
era dall' un colpo all' altro tanto intervallo che con pec-
colifino frutto, a comparazione di quello che fu fatto in 
molto tempo con facili, dove i defensori de luoghi oppugnati 
havesseno fatto di potere aditoane fare di 
tendere ripari e fortificazioni. Mai Francesi fabbricando 
pruzii molto piu espedienti, nè d'altra che di bronzo, i 
quali chiamavano cannoni, et usando palle di ferro, dove 
prima di pieta e fenza comparazione piu groffle e di pico 
gravissimo s'usavan li conducevano in falle certe irrate 
(non da buoi come in Italia si collumanva) ma da cavalli 
agilita d'umanius e di instrumento deputato a quello fer-
vigio, che quali fumero al pari de gli eserciti cavall Bezina, e 
condotte alle muraglie crano piantate con pretezza incredib-
el, et interponendoli dall' un colpo all' altro piussino-
intervallo di tempo si spoio e con impeto si gagliardo pur 
conveneva, che quello che prima in Italia fare in molti giorn-
i si soleva darlo in possibili loro faccia.

These pieces used generally to throw iron-balls from forty 
to sixty pounds in weight; and this change in the formation 
of artillery has not as yet undergone many material alter-
tions. Lighter guns indeed are now employed than those, 
that were made use of at first; but they have suffered greater 
variations in respect of size than proportion.

When, or by whom, guns were first invented is uncertain, 
since the origin both of them and of gun-powder is involved 
in obscurity; though it is highly probable, that mixtures 
or compositions similar to that of gun-powder were made 
soon after the discovery of salt-petre, because it is difficil 
to conceive how the one discovery could exist long without 
the other.

The great inerca of inflammability, which salt-petre 
gives to igneous or inflammable substances, when mixed 
with them, must soon after it was discovered itself have led 
to such a mixture. For a small part of it being either thrown 
or falling accidentally into any fire must have manifested 
this distinguishing quality in it and its prodigiously explosive 
power when mixed with burning bodies, and have led to the 
idea of rendering inflammable materials violently and ex-
cessively more so than they are naturally, and powerfully 
explosive, by mixing them with salt-petre. If the time 
could, therefore, be ascertained when this substance first 
came to be made use of, conjectures might with some fort 
of certainty, or at least probability, be formed when mix-
tures like the composition of gunpowder were first made 
or invented. Such a discovery or invention, however, might 
long exit before a convenient and advantageous method of 
applying it to military projectiles might be thought of or 
projected.

An opinion has generally prevailed, that salt-petre was first 
discovered either by the Arabsians or the later Greeks, about 
the middle ages of the christian era, when alchemy and che-
metry were much attended to and cultivated by both na-
tions. It is even said that the Arabic name for it is expe-
five of its explosive quality. And if the Greek fire made 
life of by the later Greek emperors possessed this explosive 
property, and produced the effects attributed to it, there 
must have been some salt-petre in its composition.

Whether salt-petre was known to the ancients, seems to 
be a matter of considerable uncertainty. They had, how-
ever, both in Europe and Asia, their fiery tubes or cannon, 
which, being loaded with stones, pitch, and iron balls, were 
exploded with a violent noise, much smoke, and great effect. 
And there are several passages, both in the Greek and Ro-
man writers, which show, that the Greek fire itself was used 
by both nations in their wars, and afford reasons for tracing 
it back to a much earlier date than 660, or the first flight in 
the Hellepont, commanded by Constantine Pagurates 
against the Saracens, and ascribing the invention of it to 
Marcus Grecus or Graces.

The invention of gunpowder is usually, though errone-
ously, ascribed to one Bartholdus Schwartz, who is said to 
have discovered it about the year 1250; and the Venetians 
are commonly supposed to have made the first application of 
it to military purposes in their war against the Genoese 
about the year 1580. Both of these suppositions, however, 
are certainly without foundation. For Roger Bacon, who 
lived almost fifty years before Schwartz, describes a compo-
sition perfectly resembling that of gunpowder; and unques-
tionable proofs can be produced of the use of artillery much 
earlier than the year 1580, even in Europe.

Bacon does not mention this composition as a new one, 
but speaks of it as in common use for destructive fire-works, 
and only proposes to apply a well known one to the defini-
tion of armies by the violent effects of its flame unconfined. 
This is the first well-authenticated hint, that was given in 
Europe of the application of gunpowder to warlike pur-
puses; though the Germans attempt to trace back the in-
vention of cannon as far as 1250, and ascribe it to Albertus 
 Magnus, a Dominican monk.

That gunpowder, however, was both known and made 
use of long before the time, either of Roger Bacon, or Al-
bertus Magnus, is a fact that cannot be denied. This is 
established beyond even the possibility of dispute by the treat-
ise of Marcus Grecus, entitled "Liberignium," which is in 
manuscript in the Royal library at Paris. Doctor Mead 
had the particular also in manuscript, a copy of which is now 
in the possession of the ingenious and learned Dr. Hutton. 
The author of it describes several ways of encountering 
and opposing an enemy by launching fire on him; and among 
other things, gives the following directions. Mix together 
one pound of live sulphur, two of charcoal of willow, and 
fix of salt-petre, reducing them to a very fine powder in a 
marble mortar; then put a certain quantity of this mixture 
into a long, narrow, and well compacted cover, and then 
discharge it into the air. This is exactly the description of 
a rocket. He represents the cover, with which thunder 
is imitated as short, thick, but half-filled, and strongly bound 
with packthread, which is exactly the form of a cracker. 
He then delivers different methods for preparing the match, 
and explains how one square may set fire to another in the 
air by having it inclosed within it. He describes two kinds 
of fire-works, one for flying, and the other for making a 
load report. He directs the cafe, tunica, or cartouches for 
the first to be made long and flender, and the composition 
to be very closely rammed; and the cafe for the second to 
be thick and short, and only about half filled. His com-
position for both is stronger than a great deal of gunpowder 
that is made now. It must, indeed, be acknowledged, that 
he treats as expressively and distinctly of gunpowder and the 
eflect of it, as any person writing on the subject, even if 
pretend poissibly could do. He does not, however, speak of 
man compositions as used in war, which shews at least, that 
they were known before the use of any fort of fire-arms in 
those parts of the world, in which he was acquainted with. 
And as he does not pretend to be the inventor of these rockets 
and crackers, or mention them as things new or even recent, it 
may reasonably be presumed, that they were in use long before 
his time, which is not ascertained to a certainty, though he 
himself have lived as early as at least the eighth century. We 
have reason also to conclude from the authorities of many 
authors,
CANNON.

Cannon were formerly made of a very great length, which rendered them exceedingly heavy, and the use of them very limited and troublesome. There were some of them employed by the Turks, in 1391, at the siege of Konstantinopole then in possession of the Christians, and also in 1452, which threw a weight of 120 lb.; but they could not stand repeated firing. Louis XI. had one called at Tours of the same size, that threw a ball from the Bastille to Charenton. One of these cannon, a very large one, was taken at the siege of Dien, in 1546, by Don John de la Caffre, and is now in the castle of St. Julian de Eva, ten miles from Lisbon. The length of it is twenty feet seven inches; its diameter at the middle is six feet three inches; and it threw 120 lb. weight. It has neither dolphins, rings, nor a button; is of an unusual kind of metal, and has a large Indo-Portuguese inscription on it, which says that it was cast in 1460.

Formerly strange and uncommon names were given to cannon. Thus Louis XII., in 1503, had twelve braze cannon called of an extraordinary size called after the twelve peers of France. The Spaniards and Portuguese named theirs after their saints. The emperor Charles V., when he went against Tunis, had twelve cannon founded, which he called the Twelve Apostles. At Milan there is a seventy pounder called the Pimontelli; and there is one at Bois-le-duc called the Devil. At Dover castle there is a fifty pounder called Queen Elizabeth’s pocket-pistol. There is an eighty pounder in the tower of London brought thither from Edinburgh castle called Mounts-meg. There is also an eighty pounder in the royal arsenal at Berlin called the Thunderer, and one of the same calibre at Malaga called the Terrible. There are two curious sixty pounders in the arsenal at Bremen, called the Messengers of bad news. And lastly there is an uncommon seventy pounder in the castle of St. Angelo at Rome, made of the nails that fastened the copper plates which covered the ancient Pantheon, with this inscription on it: "Ex clasribus trabalibus porticus Agrigippa."

About the beginning of the 15th century, these uncommon names were mostly laid aside, and the following among other more general ones adopted.

<table>
<thead>
<tr>
<th>Cannon, Pounders.</th>
<th>48</th>
<th>36</th>
<th>24</th>
<th>13</th>
<th>9</th>
<th>6</th>
<th>6</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Royal or carthou[h]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½ carthou[h]</td>
<td>45</td>
<td>30</td>
<td>24</td>
<td>13</td>
<td>9</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Whole culverins</td>
<td>18</td>
<td>15</td>
<td>10</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-culverins</td>
<td>15</td>
<td>12</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falcon</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saker (largest size)</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saker (ordinary)</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saker (lowest fort)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The English, however, did not manufacture many of these till towards the end of the 16th century.

Speckles of great guns, as they were first used, and before the casting of them in foundries came into practice, are still to be seen in many parts of Europe, and some of them in the tower, and the warren at Woolwich. Such an instrument or engine of war was first called bombarde, afterwards cannon, and now commonly goes by the name of a piece of ordnance or artillery. The word cannon, however, is still applied to that part of every fire-arm great or small, that receives the powder.

Guns were soon after that incident employed in war. But mortars and great guns were first made use of.

Father Daniel in his Life of Philip, of Valois, produces a proof from the records of the chamber of accounts at Paris, that cannon were used in the year 1332. And Du Cange finds mention made of them in Fruisflart, and other French historians sorne time earlier. In the list of aids raised for the redemption of John king of France, in 1368, mention is made of an officer in the French army under the denomination or appellation of major of the king’s cannon, and of his providing four large cannon for the garrison of Harleur. There was one in the arsenal of Bamberg as early as 1325. The French used them in 1338, for the attack of some castles. But they did not certainly employ them in the field against their fellow creatures near so early as the English, who under Edward III., placed five of them, in 1346, on a small hill near the village of Creffy, which chiefly contributed to decide the celebrated battle of that name. From this circumstance several of the French writers have laid claim to a greater degree of national humility than they allow to the English. One of them, treating of cannon, expresses his sentiments on the subject in the following words: “On ne peut point encore ufe en France, en 1547, de cette arme terrible contre les hommes; les Français s’en eurent bien servi, en 1338, pour l’attaque de quelques chateaux, mais ils regrettent de l’employer contre leurs semblables. Les Anglais moins humains, fans doute zous davantage et s’en fervirent a la célèbre bataille de Creccy, qui eut lieu entre les troupes du roi d’Angleterre Edouard III., qui fut si mechan, si perfide, qui donna tant de fil a retordre a Philippe de Valois, et aux troupes de ce der nier; et ce fut en majeure partie a la frayeur et a la confusion, qu’occasionnerent les canons dont les Anglais se fervoient pour la premiere fois, et qu’ils avoient paide par une colline, proche le village de Creccy, que les Francois durent leur der route.” The English also made use of them the year following, viz. in 1347, at the siege of Calais.

It is generally believed that cannon have been made use of in Europe ever since the year 1338, and that they were employed for naval purposes on the Baltic sea, in 1350. At any rate, it is certain that they were used by the Venetians, in
The French also had anciently the following pieces founded, several of which are to be found in France at this day.

<table>
<thead>
<tr>
<th>Cannon</th>
<th>Pounders</th>
<th>lb.</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basilic</td>
<td>48</td>
<td>7200</td>
<td>10 in.</td>
</tr>
<tr>
<td>Dragon</td>
<td>40</td>
<td>7000</td>
<td>16 0</td>
</tr>
<tr>
<td>Flying Dragon</td>
<td>32</td>
<td>6700</td>
<td>22 0</td>
</tr>
<tr>
<td>Le Serpent</td>
<td>24</td>
<td>4360</td>
<td>13 0</td>
</tr>
<tr>
<td>Le Conclavine</td>
<td>20</td>
<td>7000</td>
<td>16 0</td>
</tr>
<tr>
<td>Le Pafflemur</td>
<td>16</td>
<td>1200</td>
<td>18 0</td>
</tr>
<tr>
<td>L'Ape</td>
<td>12</td>
<td>1250</td>
<td>11 0</td>
</tr>
<tr>
<td>Le Pellecane</td>
<td>8</td>
<td>3500</td>
<td>15 0</td>
</tr>
<tr>
<td>Le Pelican</td>
<td>8</td>
<td>2400</td>
<td>9 0</td>
</tr>
<tr>
<td>La Demi conclavine</td>
<td>8 0</td>
<td>8700</td>
<td>13 0</td>
</tr>
<tr>
<td>Le Sacr</td>
<td>6</td>
<td>1750</td>
<td>13 0</td>
</tr>
<tr>
<td>Le Sacet</td>
<td>6</td>
<td>2500</td>
<td>12 0</td>
</tr>
<tr>
<td>Le Faucon</td>
<td>3</td>
<td>2300</td>
<td>8 0</td>
</tr>
<tr>
<td>Le Badaque,</td>
<td>2</td>
<td>1350</td>
<td>10 6</td>
</tr>
<tr>
<td>Un autre Badaque</td>
<td>3</td>
<td>700</td>
<td>8 0</td>
</tr>
<tr>
<td>L'Emerillon</td>
<td>3</td>
<td>450</td>
<td>6 0</td>
</tr>
<tr>
<td>weight,</td>
<td>400 to 450</td>
<td>405</td>
<td></td>
</tr>
</tbody>
</table>

At present cannon take their names from the weights of the balls, which they respectively discharge. Thus a piece that discharges a ball of 24 pounds, is called a 24 pounder; one that takes a ball of 12 pounds, is called a 12 pounder; and so of the rest divided into the following sorts.

Ship-guns, consisting of 42, 36, 24, 18, 12, 9, 6, and 3 pounders.

Garrison guns, consisting of 42, 32, 24, 18, 12, 9, and 6 pounders.

Battering guns, consisting of 24, 18, and 12 pounders, and sometimes though but seldom of 42 pounds.

Field pieces consisting of 12, 9, 6, 3, 2, 1, 1/2, 1, and 1/2 pounders.

The following dimensions, &c. for all sorts of brass and iron cannon were established by the Board of Ordnance in 1764.

**Brass Cannon.**

<table>
<thead>
<tr>
<th>Nature</th>
<th>Pounders</th>
<th>Length</th>
<th>Weight</th>
<th>Caliber</th>
<th>Caliber</th>
<th>Diameter of shot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy</td>
<td>42</td>
<td>9</td>
<td>6.61</td>
<td>0</td>
<td>7.51</td>
<td>6.68</td>
</tr>
<tr>
<td>Medium</td>
<td>24</td>
<td>9</td>
<td>6.29</td>
<td>0</td>
<td>6.61</td>
<td>5.54</td>
</tr>
<tr>
<td>Light</td>
<td>12</td>
<td>9</td>
<td>5.98</td>
<td>0</td>
<td>5.83</td>
<td>4.40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nature</th>
<th>Pounders</th>
<th>Length</th>
<th>Weight</th>
<th>Caliber</th>
<th>Caliber</th>
<th>Diameter of shot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass</td>
<td>42</td>
<td>9</td>
<td>6.61</td>
<td>0</td>
<td>7.51</td>
<td>6.68</td>
</tr>
<tr>
<td>Iron</td>
<td>24</td>
<td>9</td>
<td>6.29</td>
<td>0</td>
<td>6.61</td>
<td>5.54</td>
</tr>
</tbody>
</table>
# Cannon

## Iron Cannon

<table>
<thead>
<tr>
<th>Nature</th>
<th>Plumb.</th>
<th>Length</th>
<th>Weight</th>
<th>Caliber of the gun</th>
<th>Diameter of the chamber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy</td>
<td>42</td>
<td>9.05</td>
<td>0</td>
<td>7.3</td>
<td>6.58</td>
</tr>
<tr>
<td>Light</td>
<td>32</td>
<td>9.65</td>
<td>0</td>
<td>6.42</td>
<td>5.68</td>
</tr>
<tr>
<td>Heavy</td>
<td>24</td>
<td>9.63</td>
<td>0</td>
<td>5.83</td>
<td>5.45</td>
</tr>
<tr>
<td>Light</td>
<td>15</td>
<td>9.6</td>
<td>0</td>
<td>5.26</td>
<td>5.16</td>
</tr>
<tr>
<td>Medium</td>
<td>12</td>
<td>9.6</td>
<td>0</td>
<td>4.03</td>
<td>4.60</td>
</tr>
<tr>
<td>Light</td>
<td>12</td>
<td>7.629</td>
<td>0</td>
<td>4.69</td>
<td>4.69</td>
</tr>
<tr>
<td>Heavy</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Light</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Heavy</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Medium</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Light</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Heavy</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Medium</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Light</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Heavy</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Medium</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Light</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Heavy</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Medium</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
<tr>
<td>Light</td>
<td>12</td>
<td>7.6</td>
<td>0</td>
<td>4.21</td>
<td>4.21</td>
</tr>
</tbody>
</table>

The following are the dimensions, &c. established by the Board of Ordnance in 1764 for brass howitzers, which may be regarded as a sort of short cannon, mounted like guns on travelling carriages, and were much later in coming into use than either guns or mortars.

## Brass Howitzers

<table>
<thead>
<tr>
<th>Nature</th>
<th>Length</th>
<th>Weight</th>
<th>Caliber of the howitzer</th>
<th>Diameter of the chamber</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inches</td>
<td>lb. oz.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>3</td>
<td>8.0</td>
<td>7.75</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>4</td>
<td>5.62</td>
<td>4.52</td>
</tr>
</tbody>
</table>

Mortars are also a kind of short cannon of large bores, with chambers, and are made either of brass or iron. The following are the dimensions, &c. of all kinds of brass mortars, whether for land or sea service, as established by the Board of Ordnance in 1764.

## Brass Mortars

<table>
<thead>
<tr>
<th>Nature</th>
<th>Length</th>
<th>Weight</th>
<th>Caliber of the mortar</th>
<th>Diameter of the chamber</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inches</td>
<td>lb. oz.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1/2</td>
<td>1 1/2</td>
<td>0 3</td>
<td>4.52</td>
<td>4.40</td>
</tr>
</tbody>
</table>

The
C A N N O N.

The following table shews, at one view, the lengths and weights of our brass cannon as they stand at present, with their respective calibers, or the diameters of their bores, the diameters of their shot, and of their shot gauges, the quantities of powder employed for proving them respectively, their respective charges for service, for furling with them, and for loading them.

### Brass Guns of Cannon.

<table>
<thead>
<tr>
<th>Nature</th>
<th>Length</th>
<th>Weight</th>
<th>Quantity of Powder used for Service</th>
<th>Saluting Powder</th>
<th>Calibers of the Bore</th>
<th>Diameters of Shot</th>
<th>Shot Gauges</th>
<th>Number of Calibers in the length</th>
<th>Number of Pieces in the length</th>
</tr>
</thead>
<tbody>
<tr>
<td>42 Pounder Heavy</td>
<td>9 1 2 6 6 0 0 0</td>
<td>31 8 1 4 0 1 0 8 3 4 7 0 1 8 6 1 8 4 6 1 7 9 5</td>
<td>16 2 4 4</td>
<td>or near 16</td>
<td>16 2 4 4</td>
<td>or near 16 1</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>17 0 3 6</td>
</tr>
<tr>
<td>12 Pounder Heavy</td>
<td>1 0 0 5 5 0 0 0</td>
<td>1 2 1 0 1 1 1 0 2 1 2 6 4 1 0 6 1 0 5 6 3 0 7</td>
<td>19 5 7 7</td>
<td>or near 19 6</td>
<td>19 5 7 7</td>
<td>or near 19 6</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>19 6 5 6</td>
</tr>
<tr>
<td>24 Pounder Heavy</td>
<td>9 0 5 3 0 9 1 1 0 8 0 6 2 0 5 2 4 5 5 4 7 6 3 6 5 3 6</td>
<td>1 9 7 3 7</td>
<td>or near 1 9 6 5</td>
<td>1 9 7 3 7</td>
<td>or near 1 9 6 5</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>24 Pounder Medium</td>
<td>8 0 4 1 3 2 1 8 0 8 0 6 1 1 8 5 4 2 5 5 4 7 6 5 3 9</td>
<td>1 6 4 8 3 5</td>
<td>or near 1 6 4 8 3 5</td>
<td>1 6 4 8 3 5</td>
<td>or near 1 6 4 8 3 5</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>24 Pounder Light</td>
<td>5 0 1 6 3 1 3 0 1 0 5 0 5 1 1 8 5 4 2 5 5 4 7 6 5 3 9</td>
<td>1 1 3 3 2 4</td>
<td>or near 1 1 3 3 2 4</td>
<td>1 1 3 3 2 4</td>
<td>or near 1 1 3 3 2 4</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>18 Pounder Heavy</td>
<td>9 0 4 5 1 2 0 1 8 0 6 0 4 8 1 8 5 9 2 5 0 4 0 5 1 2 4</td>
<td>2 1 5 4 2</td>
<td>or near 2 1 5 4 2</td>
<td>2 1 5 4 2</td>
<td>or near 2 1 5 4 2</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>12 Pounder Heavy</td>
<td>9 0 3 1 2 8 1 2 6 0 4 6 3 0 1 4 6 2 3 4 4 0 3 4 4 7 6</td>
<td>1 9 4 6 8</td>
<td>or near 1 9 4 6 8</td>
<td>1 9 4 6 8</td>
<td>or near 1 9 4 6 8</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>12 Pounder General Defaguliers</td>
<td>7 0 1 2 1 2 1 1 2 0 4 0 3 0 1 4 6 2 3 4 4 0 3 4 4 7 6</td>
<td>2 2 9 0 1</td>
<td>or near 2 2 9 0 1</td>
<td>2 2 9 0 1</td>
<td>or near 2 2 9 0 1</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>12 Pounder Medium</td>
<td>6 0 2 1 3 0 0 9 0 3 8 3 0 0 1 2 4 6 2 3 4 4 0 3 4 4 7 6</td>
<td>1 6 5 7 2</td>
<td>or near 1 6 5 7 2</td>
<td>1 6 5 7 2</td>
<td>or near 1 6 5 7 2</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>12 Pounder Light</td>
<td>5 0 8 3 4 6 0 3 0 3 0 0 8 4 6 2 3 4 4 0 3 4 4 7 6</td>
<td>1 2 9 8 3</td>
<td>or near 1 2 9 8 3</td>
<td>1 2 9 8 3</td>
<td>or near 1 2 9 8 3</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>6 Pounder Heavy</td>
<td>8 0 1 9 1 6 6 6 6 6 0 2 2 0 2 0 8 3 6 6 8 3 4 9 6 3 5 5 2</td>
<td>2 6 1 7 2</td>
<td>or near 2 6 1 7 2</td>
<td>2 6 1 7 2</td>
<td>or near 2 6 1 7 2</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>6 Pounder General Defaguliers</td>
<td>7 0 1 2 0 2 4 6 0 2 2 0 2 0 8 3 6 6 8 3 4 9 6 3 5 5 2</td>
<td>2 2 2 9 0 1</td>
<td>or near 2 2 2 9 0 1</td>
<td>2 2 2 9 0 1</td>
<td>or near 2 2 2 9 0 1</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>6 Pounder Medium</td>
<td>5 0 1 0 0 2 0 6 6 6 6 6 0 2 2 0 2 0 8 3 6 6 8 3 4 9 6 3 5 5 2</td>
<td>1 6 5 7 7</td>
<td>or near 1 6 5 7 7</td>
<td>1 6 5 7 7</td>
<td>or near 1 6 5 7 7</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>6 Pounder Light</td>
<td>4 0 5 0 1 8 3 0 1 8 1 8 6 4 3 6 8 3 4 9 6 3 5 5 2</td>
<td>1 1 4 7 2</td>
<td>or near 1 1 4 7 2</td>
<td>1 1 4 7 2</td>
<td>or near 1 1 4 7 2</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>3 Pounder Heavy</td>
<td>7 0 1 1 3 1 9 3 0 1 0 1 0 4 2 9 1 3 2 7 7 5 2 8 2 0</td>
<td>2 8 3 3 6</td>
<td>or near 2 8 3 3 6</td>
<td>2 8 3 3 6</td>
<td>or near 2 8 3 3 6</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>3 Pounder General Defaguliers</td>
<td>6 0 6 0 0 3 0 1 0 1 0 0 4 2 9 1 3 2 7 7 5 2 8 2 0</td>
<td>3 0 2 7 0</td>
<td>or near 3 0 2 7 0</td>
<td>3 0 2 7 0</td>
<td>or near 3 0 2 7 0</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>3 Pounder Light</td>
<td>3 0 1 3 1 6 1 8 0 8 0 8 0 2 3 9 1 3 2 7 7 5 2 8 2 0</td>
<td>1 2 3 5 8 4</td>
<td>or near 1 2 3 5 8 4</td>
<td>1 2 3 5 8 4</td>
<td>or near 1 2 3 5 8 4</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
<tr>
<td>1 Pounder Heavy</td>
<td>5 0 2 2 1 2 1 0 0 6 0 6 0 1 3 2 0 1 9 1 9 2 3 1 9 5 5</td>
<td>2 9 1 7 8 1</td>
<td>or near 2 9 1 7 8 1</td>
<td>2 9 1 7 8 1</td>
<td>or near 2 9 1 7 8 1</td>
<td>20 5 5 2</td>
<td>or near 20 5</td>
<td>20 6 5 6</td>
<td>or near 20 6 5 6</td>
</tr>
</tbody>
</table>
The following is a similar table for iron guns and carronades.

**Iron Guns and Carronades.**

<table>
<thead>
<tr>
<th>Nature</th>
<th>Length</th>
<th>Weight</th>
<th>Powder for</th>
<th>Caliber Diameter of the Barrels</th>
<th>Diameter of Shot Grooves</th>
<th>Diameter of Shot</th>
<th>Number of Shots in the Length of each Gun or Gun Carriage</th>
</tr>
</thead>
<tbody>
<tr>
<td>68 Pounder Carronade</td>
<td>5</td>
<td>0.2</td>
<td>13</td>
<td>6.65</td>
<td>6.90</td>
<td>24</td>
<td>3.098</td>
</tr>
<tr>
<td>42 Pounder Gun</td>
<td>0.67</td>
<td>0.14</td>
<td>10</td>
<td>7.018</td>
<td>6.98</td>
<td>24</td>
<td>3.77</td>
</tr>
<tr>
<td>42 Pounder Carronade</td>
<td>4.32</td>
<td>22</td>
<td>0.4</td>
<td>8.18</td>
<td>6.95</td>
<td>24</td>
<td>2.73</td>
</tr>
<tr>
<td>33 Pounder Gun</td>
<td>0.58</td>
<td>0.11</td>
<td>4.8</td>
<td>7.35</td>
<td>6.78</td>
<td>24</td>
<td>1.77</td>
</tr>
<tr>
<td>35 Pounder Carronade</td>
<td>4.04</td>
<td>0.14</td>
<td>4.0</td>
<td>8.25</td>
<td>6.60</td>
<td>24</td>
<td>1.72</td>
</tr>
<tr>
<td>22 Pounder Gun</td>
<td>0.52</td>
<td>0.08</td>
<td>6.0</td>
<td>7.82</td>
<td>5.54</td>
<td>24</td>
<td>1.63</td>
</tr>
<tr>
<td>24 Pounder Carronade</td>
<td>3.74</td>
<td>0.06</td>
<td>3.0</td>
<td>5.67</td>
<td>5.67</td>
<td>24</td>
<td>1.57</td>
</tr>
<tr>
<td>16 Pounder Gun</td>
<td>0.15</td>
<td>0.04</td>
<td>4.0</td>
<td>5.29</td>
<td>5.04</td>
<td>24</td>
<td>1.52</td>
</tr>
<tr>
<td>18 Pounder Carraonade</td>
<td>3.3</td>
<td>0.04</td>
<td>2.0</td>
<td>5.14</td>
<td>5.04</td>
<td>24</td>
<td>1.53</td>
</tr>
<tr>
<td>12 Pounder Gun</td>
<td>0.36</td>
<td>0.03</td>
<td>8.0</td>
<td>4.63</td>
<td>4.40</td>
<td>24</td>
<td>1.49</td>
</tr>
<tr>
<td>12 Pounder Carronade</td>
<td>2.2</td>
<td>0.10</td>
<td>8.0</td>
<td>4.58</td>
<td>4.40</td>
<td>24</td>
<td>1.49</td>
</tr>
<tr>
<td>9 Pounder Gun</td>
<td>0.30</td>
<td>0.02</td>
<td>4.0</td>
<td>4.20</td>
<td>4.00</td>
<td>24</td>
<td>1.49</td>
</tr>
<tr>
<td>6 Pounder Gun</td>
<td>0.60</td>
<td>0.01</td>
<td>2.0</td>
<td>3.60</td>
<td>3.49</td>
<td>24</td>
<td>1.49</td>
</tr>
<tr>
<td>4 Pounder Gun</td>
<td>0.60</td>
<td>0.01</td>
<td>2.0</td>
<td>3.20</td>
<td>3.10</td>
<td>24</td>
<td>1.49</td>
</tr>
<tr>
<td>3 Pounder Gun</td>
<td>0.60</td>
<td>0.01</td>
<td>2.0</td>
<td>2.91</td>
<td>2.77</td>
<td>24</td>
<td>1.49</td>
</tr>
<tr>
<td>2 Pounder Gun</td>
<td>0.60</td>
<td>0.01</td>
<td>2.0</td>
<td>2.54</td>
<td>2.43</td>
<td>24</td>
<td>1.49</td>
</tr>
<tr>
<td>1 Pounder Gun</td>
<td>0.60</td>
<td>0.01</td>
<td>2.0</td>
<td>2.16</td>
<td>2.03</td>
<td>24</td>
<td>1.49</td>
</tr>
<tr>
<td>½ Pounder Gun</td>
<td>0.60</td>
<td>0.01</td>
<td>2.0</td>
<td>1.78</td>
<td>1.63</td>
<td>24</td>
<td>1.49</td>
</tr>
</tbody>
</table>

The following is a similar table for the lengths, weights, &c. of brass mortars, which are pieces of artillery, and may be regarded as a species of short cannon, used by us at present.

**Brass Mortars.**

<table>
<thead>
<tr>
<th>Nature</th>
<th>Length</th>
<th>Weight</th>
<th>Powder for</th>
<th>Shells contain</th>
<th>Medium range at Perpendicular Elevation</th>
<th>Chamber containing Shells</th>
<th>Powder for Mortar Shells</th>
<th>Scaling for Mortar Shells</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Inches Sea Service</td>
<td>5</td>
<td>20</td>
<td>0.50.30</td>
<td>10</td>
<td>4.197</td>
<td>4.100</td>
<td>12.01</td>
<td>40</td>
</tr>
<tr>
<td>3 Inches Land Service</td>
<td>3</td>
<td>32</td>
<td>0.50.11</td>
<td>10</td>
<td>4.197</td>
<td>4.100</td>
<td>12.01</td>
<td>40</td>
</tr>
<tr>
<td>10 Inches Sea Service</td>
<td>4</td>
<td>33</td>
<td>0.50.12</td>
<td>5</td>
<td>5.93</td>
<td>5.800</td>
<td>12.00</td>
<td>40</td>
</tr>
<tr>
<td>10 Inches Land Service</td>
<td>2</td>
<td>10</td>
<td>0.50.31</td>
<td>4</td>
<td>5.93</td>
<td>5.800</td>
<td>12.00</td>
<td>40</td>
</tr>
<tr>
<td>8 Inches Land Service</td>
<td>2</td>
<td>10</td>
<td>0.50.12</td>
<td>5</td>
<td>5.93</td>
<td>5.800</td>
<td>12.00</td>
<td>40</td>
</tr>
<tr>
<td>4.6 Inches Land Service</td>
<td>1</td>
<td>10</td>
<td>0.50.15</td>
<td>7</td>
<td>8.07</td>
<td>8.000</td>
<td>12.00</td>
<td>40</td>
</tr>
<tr>
<td>4.5 Inches Land Service</td>
<td>1</td>
<td>10</td>
<td>0.50.15</td>
<td>7</td>
<td>8.07</td>
<td>8.000</td>
<td>12.00</td>
<td>40</td>
</tr>
</tbody>
</table>
CANNON.

The following is a similar table for the lengths, weights, &c. of iron mortars used by us at present.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ft. in.</td>
<td>cwt. lb.</td>
<td>oz.</td>
<td>lb. oz.</td>
</tr>
<tr>
<td>13 Inches</td>
<td>3 0 0</td>
<td>0 0 0</td>
<td>3 0 0</td>
<td>8 0 0</td>
</tr>
<tr>
<td>10 Inches</td>
<td>6 4 0</td>
<td>4 3 0</td>
<td>1 4 0</td>
<td>2 8 0</td>
</tr>
</tbody>
</table>

The following is a similar table for howitzers, as we now use them.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ft. in.</td>
<td>cwt. lb.</td>
<td>oz.</td>
<td>lb. oz.</td>
</tr>
<tr>
<td>10 Inches</td>
<td>3 1 1</td>
<td>1 1 1</td>
<td>3 7 1</td>
<td>4 1 1</td>
</tr>
<tr>
<td>8 Inches</td>
<td>3 1 1</td>
<td>1 1 1</td>
<td>3 7 1</td>
<td>4 1 1</td>
</tr>
<tr>
<td>5.6 Inches</td>
<td>2 4 0</td>
<td>4 0 0</td>
<td>1 4 0</td>
<td>1 8 0</td>
</tr>
<tr>
<td>4.5 Inches</td>
<td>1 1 1</td>
<td>1 1 1</td>
<td>1 1 1</td>
<td>1 1 1</td>
</tr>
</tbody>
</table>

The interior parts of a cannon are the following:

a. The bore, which is the interior cavity which receives the powder and shot. 

b. The mouth, which is the entrance of the bore. 

c. The vent, which is in all kinds of firearms is commonly or vulgarly called the touch-hole. It is a small hole, pierced at or near the end of the bore or chamber for priming the piece with powder, or for introducing the tube, in order, when lighted, to set fire to the charge. 

d. The chamber, which is used only in guns of large calibers, is the place where the powder forming the charge is lodged.

The following are tools for loading and firing cannon.

Coins, or wedges, which are laid under the breech of a gun, for the purpose of either elevating or depressing it.

Handspikes, for moving and laying it with.

Ladles, for loading the gun with loose powder.

Rammers, which are cylinders of wood, of the same diameters and axes with the shot. They serve for ramming the wads put upon the powder and shot.

The sponge, which is fixed at the opposite end of the rammer, covered with lambkin. It serves for cleaning out the gun when fired.

Screws, which are used with field-pieces, instead of coins or wedges. The screw serves not only for elevating or depressing the gun, but for keeping it at the same angle of elevation or depression.

Tools necessary for proving cannon are the searchers with a reliever, and the searcher with one point.

The searcher is an iron, hollow at one end to receive a wooden handle, and on the other end has from four to eight bat
CANNON.

Distance from the ogee to the fore part of the aftragal one calibre
Breadth of each of the fillets of the aftragal - 0.25
Breadth of the aftragal, or half round - 0.56
Total breadth of the aftragal and fillets - 1.12
Breadth of each of the fillets at the first and second reinforce ring - 0.25
Breadth of the first and of the second reinforce rings - 1.25
Breadth of the ogee, next to these rings - 1.5
Breadth of the fillets at the muzzle - 0.25

The muzzle ogee in a 12 pounder, and guns of higher calibers is equal to 1.25 inches or 1 ¼ inch. But in a 9 pounder, and guns of smaller calibers, it is only equal to one inch. The chase-gridle and aftragal are equal to one calibier.

The distance from the mouth of the gun to the muzzle aftragal is equal to a diameter of the second reinforce ring, in 18 pounders and guns of higher calibers; but in a 12 pounder, and guns of smaller calibers, it is equal to the diameter of the first reinforce ring.

The rising or swelling of the mouldings at the first and second reinforce is about an eighth part of an inch; and the rising of the base-ring is determined by laying a ruler to the extremities of the first and second reinforce mouldings.

The diameter of the gun, through the swelling of the metal at the muzzle, is always equal to the diameter of the second reinforce ring.

Parts of the Caiseable.

From the hind part of the base ring to the fore part of the fillet next to the button, the distance is equal to three-fourth parts of a calibre. The distance from the fore part of the fillet next to the button to the centre of the button is equal to one calibre. The distance from the hind part of the base ring to the hind part of the fillet, between the two ogees, is a sixth part of the calibre. The diameter of the fillet next to the button is equal to one calibre and a half. The diameter of the neck of the caseable is equal to three fourth parts of a calibre. The diameter of the button is somewhat more than one calibre.

It is proper to observe, that the shell at the vent is three inches broad, and reaches from the base ring to within a quarter of an inch of the vent-aftragal, leaving that space for the sake of turning. And the vent is the fifth part of an inch.

General dimension, according to this construction, for iron guns.

Supposing the calibre of the gun to be divided into 14 equal parts, we shall have,

The thickness of the metal at the vent from the bore 16
The thickness of do. at the end of the first reinforce, equal to - - - - 14.5
The thickness of do. at the beginning of the second reinforce equal to - - - - 13.5
The thickness of do. at the end of the second reinforce equal to - - - - 12.5
The thickness of do. at the beginning of the chase equal to - - - - 11.5
The thickness of do. at the end of the chase or muzzle, equal to - - - - 8

The mouldings, and the rest of the dimensions, are nearly the same as in the bras guns. The diameter of the vent, however, in his iron guns, is one-fourth part of an inch, whereas it is only a fifth part of an inch in his bras cannon.

The length of bras guns, according to him (general Armstrong), are the following:

The
Cannon.

The 32 pounder 10
The 44 pounder 9.5
The 38 pounder 9.5
The 12 pounder 9
The 6 pounder 8
The 3 pounder 7
The 1.5 pounder 6

And, according to him, the length of the iron

32 pounder was 9.5
Of the 44 pounder - 9
Of the 38 pounder - 9
Of the 12 pounder - 8
Of the 6 pounder - 7
Of the 3 pounder - 6
And of the 1.5 pounder - 5.5

General Armstrong, in order to ascertain the fitted and belt lengths for battering pieces, made experiments in 1755 with brass 24 pounders of different lengths, but of nearly the same weight. After a great number of trials and experiments with them, he fixed on nine feet six inches as the belt length for a 24 pounder battering piece, though none of the ranges with one only nine feet long, with the same charge of two-thirds of the weight of the ball, and with the same elevation, were somewhat greater than the greatest of those with one nine feet six inches long.

In the following table are the lengths of the 24 pounders with which he made a multiplicity of experiments, and three of the longest ranges of each, loaded with sixteen pounds of powder.

<table>
<thead>
<tr>
<th>Brass 24 Pounders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length in Feet.</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>11.5</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>12.5</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>13.5</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>14.5</td>
</tr>
<tr>
<td>15</td>
</tr>
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<td>15.5</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td>16.5</td>
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<tr>
<td>17</td>
</tr>
<tr>
<td>17.5</td>
</tr>
<tr>
<td>18</td>
</tr>
<tr>
<td>18.5</td>
</tr>
<tr>
<td>19</td>
</tr>
<tr>
<td>19.5</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>20.5</td>
</tr>
<tr>
<td>21</td>
</tr>
<tr>
<td>21.5</td>
</tr>
<tr>
<td>22</td>
</tr>
<tr>
<td>22.5</td>
</tr>
<tr>
<td>23</td>
</tr>
<tr>
<td>23.5</td>
</tr>
</tbody>
</table>

Now it is obvious that if we even suppose all these pieces to have been bored exactly alike, and their vents to have been placed also exactly alike, with regard to the bottoms of their bore, these experiments are not calculated for determining precisely the belt length of a 24 pounder, either for battering in breach, or for any other service. For these suppositions relative to their respective bores and vents being even granted, no other inference can be drawn from them than this, that nine feet six inches is about the belt length for a 24 pounder, that is to be used with a charge of 16 pounds of powder. But a charge equal to two-thirds of the whole weight of the ball is proproporionately large for any kind of service whatsoever. It does not follow from them that nine feet six inches would have been found the belt for a 24 pounder, had the charge been made use of been one-half, one-third, one-fourth, or even one-fifth part of the weight of the ball, the last of which, if the windage be very small, is sufficient even for battering with.

If a specific charge of powder be fixed on as the fitted for a gun of a given caliber for a given service, the belt way to ascertain the proper length of such a gun, it appears, would be to have one of that caliber cast longer than what is necessary, and then to cut it shorter and shorter, by a few inches at a time, firing it always at the same elevation with the Vol. VI.
It appears from these experiments, that when those eighteen pounders were charged with not pounds of powder, their ranges were generally somewhat greater at the same elevation than they were when loaded with either more or less; and that the fee of the eighteen pounder, nine feet long, exceeded that of the other, eleven feet long, with the same charge of half the weight of the ball.

They have every appearance of having been made with attention and accuracy. But as they were all made with a charge of powder by far too great for any kind of service with an eighteen pounder, no just conclusion can be drawn from them with regard to the ball length for a gun of that caliber. Besides, as there were only two lengths made use of, the only inference one can be justified in deriving from them is, that nine feet is a better length than eleven feet for an eighteen pounder, when fired with nine pounds of power. They have no tendency whatsoever to determine what length is best for a cannon of that caliber, when fired with six, or four, &c. pounds of powder.

Mr. Muller, however, regarded them as perfectly conclusive on this head, from finding that 4160 yards, the greatest range of the piece, nine feet long, at an elevation of 45 degrees, with nine pounds of powder, differed only thirty yards from 4190 yards, the greatest possible range of a gun of that caliber, according to an erroneous theory of his, founded on a misconception of Sir Isaac Newton's meaning, in the second book of his Principia, and expresses himself exultingly in the following words. "Thus we have at last determined that important question in artillery sought for ever since its invention."

This gentleman, after ascertaining that the greatest velocity which a leaden bullet of three quarters of an inch diameter can possibly have is that which, uniformly continued, would carry it through 355 feet per second, animadverts on Mr. Robins's method of determining the velocities of shot in the following words.

"Mr. Robins thinks to prove, in his seventh problem, that the velocity of the foregoing leaden bullet is 1668 feet in a second, which is more than four times greater than that above, and, what is more extraordinary, he pretends to have found the same velocity by experiments. As he seems to build his theory upon Sir Isaac Newton's principles, had he read the 4th proposition, book second, of his Principia, he must have been convinced of his mistake."

This is a heavy charge, and were it well founded, would, in a great measure, invalidate all that Mr. Robins has advanced, in regard to the determination of the first velocities of shot, as this is the only example that Mr. Robins calculates in his seventh proposition from his theory of the elastic force of the fluid generated by the firing of gunpowder, which he compares, in his ninth proposition, with the velocity ascertained by means of his ballistic pendulum, and finds to be almost the same. This is the place that Mr. Muller refers to, when he speaks of Mr. Robins as pretending to have found the same velocity by experiments. It is, moreover, deferving of observation, that Mr. Robins does not speak of this velocity as the greatest that can possibly be communicated to such a ball. For a much greater one undoubtedly may be so communicated. And it cannot with justice be alleged that Mr. Robins built this part at least of his theory on Sir Isaac Newton's principles, as his method of determining the first velocities of bullets is entirely his own. The mistake lies not with Mr. Robins, but with Mr. Muller himself, who could not, when he made the animadversion, have read with proper attention the said 40th proposition of the second book of the Principia, which relates entirely to the defecit of bodies in an infinitely comprized and perfectly fluid medium; whereas as Mr. Robins's calculation just mentioned refers expressly to projectile motion: and that projectile velocity may be much greater than the greatest velocity, by which a body can be conveyed by its comparative weight in such a fluid, is what no person, who has considered the subject with the least attention, will offer to deny. Even Galileo himself, who was the first that studied with any care the motions of projectiles and the nature of resisting mediums, seems to have been sufficiently of this truth. For, in his fourth dialogue, after observing that the heaviest bodies would in time, by descending in the air, acquire a degree of velocity which could not afterwards be increased in the same manner as we see light bodies soon arrive at their greatest velocity possible, he says, "This determine and ultimate velocity may be called the greatest which such a heavy body can naturally obtain in the air. But this velocity I imagine to be much less than that which is given to the same ball flung by fired powder." And he proposes to prove this, by first firing a musket loaded with a leaden ball and a proper charge of powder from a hundred yards high or more against a stone pavement, and then firing the same with a like charge against a stone of the same kind at a few yards distance, and examining which of the balls was most flattened. Every body now knows that this imagination of his was perfectly just.

Sir Isaac Newton begins the said proposition in his second book with a rule for determining the greatest velocity, with which a globe can descend in an infinitely comprized and perfectly fluid medium. His words are the following: "Sit A pondus globi in vacuo, B pondus ejus in medio resistente, D diameter globi, F spatium, quod sit at 4 x D ut densitas globi ad densitatem medi, id eft, ut A ad A - B ; G tempus quo globus pondere B fine resistit caedendo defcribit spatium F ; Et H velocitates, quam globus hoccet fua acquirit. Et eft H velocitates maxima, quacum globus pondere fua B in medio resistit potefc defendere." This, however, is the very rule, as is found by calculation, that Mr. Muller made use of for determining the greatest possible projectile velocity of a bullet of three quarters of an inch diameter, as well as those of larger ones. It is not, therefore, to be wondered at, that he has given a very erroneous table of the greatest possible velocities of shot of different diameters, from three pounds up to forty-eight, and of their greatest ranges.

As twenty-one diameters of an eighteen pounder shot are nearly equal to nine feet, and as nine pounds of powder were a charge equal in weight to half that of the shot, Mr. Muller concluded that guns of all calibers having their lengths and charges respectively proportional to these, would give greater ranges than guns of the same calibers with any other lengths and charges, greater or less, would give, supposing, without sufficient reason for doing so, the greatest velocities to be always proportional to the diameters of the shot.

He accordingly, in his constructions for guns, makes both battering and garrison cannon from eighteen to twenty-one diameters of their shot long respectively.

He allows, however, that though it is of advantage to know the ball length and charge for every piece, the lengths of guns must depend on the services they are intended for. He observes, that ship-guns should, for various reasons, be short and light; that field-pieces, or battalion-guns, should also be short and light, in order to be able to advance or retire as fast as the army; that battering pieces should be long enough to prevent the flame of the powder, when they are repeatedly fired, from damaging much, or destroying very suddenly the fides of the embrasures; and that garrison guns ought to be of the lengths that give the greatest range.
ranges, to oblige the besiegers to break ground at the greater distance, and to reach shipping, &c. from forts near the sea, or navigable rivers, as far off from them as possible.

In his general construction of brass cannon for the land service, he supposes the length of the gun to be twenty-one diameters of the shot from a twenty-four pounder inclusive, downwards, giving, however, the same length to the thirty-two pounder and to the forty-two pounder that he gives to the twenty-four pounder, making thereby the diameter of the first of these about nineteen diameters of the shot, and that of the last about seventeen diameters of the shot and one third.

The Conception is this.

Let the length AB of the piece (see fig. 1.) be twenty-one diameters of its shot; and let the diameter of the shot be divided into twenty-four equal parts, from which all the rest of the dimensions are to be determined. Make the Diameter of the bore equal to 25 such parts.

The distance from A, the hind part of the base-ring, to D, the fore part of the vent-aftragal, is 40 such parts.

The thickens of the metal at the breech and vent are 18.5 such parts.

Then the lines drawn from these points will determine the figure of the gun, which will be therefore from A to D cylindrical, and from thence to the mouth conical.

The centre line of the trunnions crosses the centre line of the bore at right angles, and at the distance of three tenths of the whole length AB of the gun, from the hind part A of the breech; the diameter of each of them is equal to eighteen such parts, and its length is equal to its diameter, exclusive of the projection of the second reinforce ring.

The length EF of the second reinforce is always equal to two-thirds of AE, the length of the first reinforce. The breech AC is equal to sixteen such parts; and the chace-girdle is equal to fourteen. The muzzle HB is equal to a tenth part of the whole length of the gun, which is here equal to 50.4 such parts.

The breadth of the base-ring and ogive next to it are each of them equal to 6 such parts.

The first and second reinforce rings, and the ogive next to them, are each of them equal to 5 such parts.

Each aftragal and fillets are equal to 4 such parts.

The cavetto at the mouth is equal to 2.5 such parts.

And the fillets are each equal to 1 of such parts.

The base-ring projects the metal two such parts, the first and second reinforce rings, about one such part; the fillets of the aftragals, the half of one such part; and the round of each aftragal is described from a centre in the outline of the piece.

There is a circular shoulder about each of the trunnions, of which the diameter exceeds that of either of the trunnions by six such parts, and projects so as to be even with the second reinforce-ring.

As to the calculable (see fig. 2.) the distance from A, the hind part of the base-ring, to C, the centre of the button, is equal to twenty-seven such parts; the radius of the button to N, the breadth of the quarter round to two; the ogive to five, and the fillets each to one. If from C, the centre of the button, right lines be drawn to the extremities E F of the base-ring, and points O O be found in these lines equally distant from the button and the second fillet, arcs described from these points with that distance will determine the

C A, whilst right lines OP parallel to CA, the direction of the axis of the piece, will fix the extremes, or limit the hind part of the second fillet, and C F determines the first.

In order to describe the ogee, join the extremities e, q, of the hind parts of the fillets; through the point q, draw the indefinite right line, q p, parallel to OP produced; bisect the right line e q in the point r, and through the point of bisection r draw a right line making angles with e q equal each to the angle s q l, and meeting q l and O q produced in the points, p, r, respectively. Then arcs described from the points P, r, as centres, with a radius equal to P r, P q or q r, will determine the ogee e q r. The quarter round is determined by so describing an arc from a point r in q p produced, that it shall meet the hind part of the base-ring within one of such parts, as the diameter of the shot contains twenty-four. The breadth of the fillet is equal to six such parts, and the diameter of the vent is a fifth part of an inch.

As to the muzzle (see fig. 3.) take the right line B K, equal to twenty such parts, B L equal to six such parts, and draw P L equal to B P, at right angles to B K. From the point K draw also a right line perpendicular to B K. Then if the right line joining the points L, B, be produced to meet this last-mentioned perpendicular in the point I, an arc is described from this point as a centre, with the radius I L, or I K, will determine the cavetto, or concave quarter, round L K. And if through the point a, at the distance of four such parts from B H, and parallel to the same, the right line a r be drawn, in it take a point r at equal distances from the point L, and the extremity of the hind part of the fillet for describing from as a centre, the quarter round, with this distance as radius.

From this construction, with twenty-one diameters of the shot, for the lengths of brass guns respectively for land service, from a 24 pounder inclusive downwards; and with 14 diameters of the shot for lengths of iron field-pieces respectively, he has given us table of the weights and dimensions of each, which are the following.

<table>
<thead>
<tr>
<th>Caliber</th>
<th>Length</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 pounder</td>
<td>9.1 18 0 4</td>
<td>3 pounder</td>
</tr>
<tr>
<td>9 pounder</td>
<td>7.2 0 0 0</td>
<td>6 pounder</td>
</tr>
<tr>
<td>12 pounder</td>
<td>8.16 0 6</td>
<td>9 pounder</td>
</tr>
<tr>
<td>18 pounder</td>
<td>9.24 0 12</td>
<td>12 pounder</td>
</tr>
<tr>
<td>24 pounder</td>
<td>8.32 0 16</td>
<td>18 pounder</td>
</tr>
<tr>
<td>32 pounder</td>
<td>8.32 0 22</td>
<td>24 pounder</td>
</tr>
<tr>
<td>42 pounder</td>
<td>8.52 0 24</td>
<td>6 pounder</td>
</tr>
</tbody>
</table>

He gives another general construction for brass battering pieces on the supposition that the length, A B (see fig. 1.) of each is only equal to eighteen diameters of its shot, with all the other parts of the construction remaining the same as above.

From this construction he gives another table for brass battering pieces, and compares them with the old, as follows.
CANNON.

Lengths and weights of brass battering pieces.

<table>
<thead>
<tr>
<th>Old Pieces.</th>
<th>New Pieces.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 pounder</td>
<td>8 3/16</td>
</tr>
<tr>
<td>9 pounder</td>
<td>8 5/16</td>
</tr>
<tr>
<td>13 pounder</td>
<td>8 3/16</td>
</tr>
<tr>
<td>18 pounder</td>
<td>8 3/16</td>
</tr>
<tr>
<td>24 pounder</td>
<td>8 3/16</td>
</tr>
<tr>
<td>32 pounder</td>
<td>8 5/16</td>
</tr>
</tbody>
</table>

These calculations are on the supposition that the guns are cylindrical as far as the charges reach, and load trunses conical to the mouth. The centre line of the trunses is also supposed to intersect the longitudinal axis of the bore of each gun at right angles, to prevent it, when fired, from injuring or destroying its carriage, which it would do if the said line be lower.

The quantity and weight of metal in a gun by this calculation he determines in the following manner.

Take the diameter of the gun across the centre of the bore at the muzzle without the mouldings, which is equal to forty-three such parts as the twenty-four, into which the diameter of the shot is supposed to be divided, and the square of it is 1849.

To this he adds the square of sixty-one, the number of such parts in the diameter of the gun at the ventialtage.

To thes he adds the rectangle under these two diameters or 43·× 61 = 2623.

The sum of these three products is 8193.

The third part of this sum is 2731.

Which multiplied by 392, the number of such parts in the length AB as the twenty-four, into which the diameter of the shot is supposed to be divided, gives 1070572.

To this content add the square of the diameter 61 by 263 the number of such parts in the length AD = 48840.

To these two contents add four times the cube of eighteen such parts for the contents of the trunses, castable, and mouldings = 23338.

And the sum will be equal to 1242720.

From this sum of these three contents deduct the square of twenty-five, the number of such parts in the diameter of the bore multiplied by its length 416 in such parts = 260000.

And the remainder will be equal to 982720.

Which content, reduced in the proportion of the area of a circle to the length of its diameter gives 771826 for the number of cubic such parts, as the twenty-four, into which the diameter of the shot is supposed to be divided, that expresses the solid contents of metal in the gun.

But the number of cubic parts in a ball, of which the diameter is equal to twenty-four parts, is about 7238.246, by which, if 771826 be divided, we get 106.21 nearly, which increased in the proportion of the weight of gun metal to that of cast iron, of 8754 to 7435, becomes 125.65 nearly, or 126 in whole numbers nearly.

Whence it is manifest that this construction gives the weight of each gun, equal to about 126 times the weight of its shot supposing the diameter of the bore to be to that of the shot 23 2/3 to 24, a proportion, however, that certainly leaves by far too much weightage. Thus a nine-pounder brass gun by it will weigh 1153 lb. or 72 cwt. and 14 lb.

He then gives a general construction for battering and garrison iron cannon supposing the length AB of each to be equal to twenty-one diameters of its shot.

He supposes the diameter of the shot to be divided into twenty-four equal parts as in the preceding construction, and makes the diameter of the bore equal to twenty-five such parts. He makes the length from A, the hind part of the bafe-ring, to D, the fore part of the ventialtage, equal to forty-eight such parts. He gives a thinnest of the metal at A and D, taken from the bore, equal to twenty-five such parts, or to one diameter of the bore; and he makes its thinnest at B, the mouth of the piece, equal to twelve such parts, or to half the diameter of the shot.

He supposes the centre line of the trunses to intersect the axis of the bore at right angles, at the distance of three-fourths of the whole length of the gun, or nine diameters of the shot from A, the hind part of the breech. He makes the diameter of each of them equal to one diameter of the shot, and the length of each, free from the projection of the second reinforce ring, equal to the same.

By this construction he allows about two hundred weight of metal for every pound of the shot's weight, or makes the weight of each gun equal to about 254 times that of its shot.

And from this proportion is derived the following table for battering and garrison iron-pieces.

<table>
<thead>
<tr>
<th>Caliber.</th>
<th>Length.</th>
<th>Weight.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Pounder</td>
<td>4 ft. 6 in.</td>
<td>6 cwt. qtr. lb.</td>
</tr>
<tr>
<td>4 Pounder</td>
<td>5 ft. 4 in.</td>
<td>8 cwt. qtr. lb.</td>
</tr>
<tr>
<td>6 Pounder</td>
<td>6 ft. 2 in.</td>
<td>12 cwt. qtr. lb.</td>
</tr>
<tr>
<td>9 Pounder</td>
<td>7 ft. 2 in.</td>
<td>18 cwt. qtr. lb.</td>
</tr>
<tr>
<td>12 Pounder</td>
<td>8 ft. 4 in.</td>
<td>24 cwt. qtr. lb.</td>
</tr>
<tr>
<td>18 Pounder</td>
<td>9 ft. 3 in.</td>
<td>36 cwt. qtr. lb.</td>
</tr>
<tr>
<td>24 Pounder</td>
<td>10 ft. 6 in.</td>
<td>48 cwt. qtr. lb.</td>
</tr>
</tbody>
</table>

The thirty-two pounder is the only gun in this table that is shorter than twenty-one diameters of its shot, being only about nineteen of the same. It is also heavier by two hundred weight, than two-hundred and twenty-four times the weight of its shot. For these deviations, however, from his general rule, he has assigned no reasons. And for them we are inclined to think, that no good ones can be given. We are also of opinion, that a much smaller weight of metal for every pound of the shot's weight would be perfectly sufficient.

In his construction of brass guns for ships, he supposes AB, the length of the piece, to be equal to fifteen times only the diameter of the shot; which diameter he divides, as above, into twenty-four equal parts, making the diameter of the bore equal to twenty-five such parts.

He makes the distance from A, the hind part of the bafe-ring, to D, the fore part of the ventialtage, equal to forty such parts; the breech AC, equal to eighteen, the thinnest of the metal at A, and at D, equal to twenty, and at B, the mouth of the piece, equal to ten. The rest of the con-
construction is the same as above, with this exception, that the diameter, as well as the length of each of the trunnions, is half of being equal to one diameter of the shot, or twenty-four equal parts.

By a similar computation to that made use of above, it appears that this construction allows about one hundred and twenty-four pounds of gunmetal for every pound of the shot's weight, or that the weight of each gun is by it about one hundred and twenty-four times that of its shot, from which proportion, the following table is very nearly framed.

### Brass Ship Guns

<table>
<thead>
<tr>
<th>Caliber</th>
<th>Length</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Pounder</td>
<td>6 in. 6 qt. 1 lb.</td>
<td>12 lb.</td>
</tr>
<tr>
<td>6 Pounder</td>
<td>4 0 2 14</td>
<td>24 lb.</td>
</tr>
<tr>
<td>9 Pounder</td>
<td>5 0 10 0</td>
<td>36 lb.</td>
</tr>
<tr>
<td>12 Pounder</td>
<td>4 13 1</td>
<td>48 lb.</td>
</tr>
<tr>
<td>18 Pounder</td>
<td>6 4 10 0</td>
<td>72 lb.</td>
</tr>
<tr>
<td>24 Pounder</td>
<td>7 6 2 2</td>
<td>96 lb.</td>
</tr>
<tr>
<td>32 Pounder</td>
<td>7 6 2 2</td>
<td>128 lb.</td>
</tr>
<tr>
<td>42 Pounder</td>
<td>8 4 52 2</td>
<td>192 lb.</td>
</tr>
<tr>
<td>48 Pounder</td>
<td>8 6 6 0</td>
<td>216 lb.</td>
</tr>
</tbody>
</table>

In his general construction for iron ship-guns, he likewise supposes the length of each piece to be equal to fifteen diameters of its shot; the diameter of the shot to be divided into twenty-four equal parts; the diameter of the bore to be equal to twenty-five such parts; the distance from A, the hind part of the breech, to D, the fore part of the vent, to be equal to forty such parts; the breech to be equal to twenty-four such parts, or to one diameter of the shot; the thickens of the metal in the vent to be equal to one diameter, and at the mouth to half a diameter.

It appears by computation, that the quantity of metal, allowed by this construction, is at the rate of about one hundred and forty pounds, or of one hundred weight and one quarter to every pound weight of the shot; or that each gun is by it about one hundred and forty times as heavy as its shot; from which proportion the following table is derived.

### Field Pieces

<table>
<thead>
<tr>
<th>Caliber</th>
<th>Length</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Pounder</td>
<td>3 2 1 2</td>
<td>6 lb.</td>
</tr>
<tr>
<td>6 Pounder</td>
<td>4 7 5 8</td>
<td>12 lb.</td>
</tr>
<tr>
<td>9 Pounder</td>
<td>5 8 3 0</td>
<td>18 lb.</td>
</tr>
<tr>
<td>12 Pounder</td>
<td>5 8 3 0</td>
<td>24 lb.</td>
</tr>
<tr>
<td>18 Pounder</td>
<td>6 2 7 3</td>
<td>36 lb.</td>
</tr>
<tr>
<td>24 Pounder</td>
<td>7 6 2 2</td>
<td>48 lb.</td>
</tr>
<tr>
<td>32 Pounder</td>
<td>7 6 2 2</td>
<td>64 lb.</td>
</tr>
<tr>
<td>42 Pounder</td>
<td>8 4 52 2</td>
<td>96 lb.</td>
</tr>
<tr>
<td>48 Pounder</td>
<td>8 6 6 0</td>
<td>108 lb.</td>
</tr>
</tbody>
</table>

He also gives a construction for iron garrison-pieces, supposing the length of each to be equal to eighteen diameters of its shot, and the rest of the construction to be the same as that for iron ship-guns, allowing thereby about one hundred and seventy-two pounds, and two thirds of a pound of metal to each piece, for every pound of the shot's weight, which proportion produces the dimensions and weights in the following table.

### Iron Garrison Pieces

<table>
<thead>
<tr>
<th>Caliber</th>
<th>Length</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Pounder</td>
<td>4 2 4 12</td>
<td>12 lb.</td>
</tr>
<tr>
<td>6 Pounder</td>
<td>5 3 9 1</td>
<td>24 lb.</td>
</tr>
<tr>
<td>9 Pounder</td>
<td>6 13 3 12</td>
<td>36 lb.</td>
</tr>
<tr>
<td>12 Pounder</td>
<td>6 7 18 2</td>
<td>48 lb.</td>
</tr>
<tr>
<td>18 Pounder</td>
<td>7 6 27 3</td>
<td>72 lb.</td>
</tr>
<tr>
<td>24 Pounder</td>
<td>8 4 37 0</td>
<td>96 lb.</td>
</tr>
<tr>
<td>32 Pounder</td>
<td>9 2 49 2</td>
<td>128 lb.</td>
</tr>
<tr>
<td>42 Pounder</td>
<td>10 0 64 0</td>
<td>192 lb.</td>
</tr>
</tbody>
</table>
C A N N O N.

Of short Cannon, such as Mortars, Howitzers, and Carro-

Mortars are a sort of cannon with short and large bores, with chambers, and are thought to be the first pieces of artillery that were used, as they were employed to throw balls of red-hot iron and stones long before the invention of shells, which is ascribed to a native of Venlo, who at a festival celebrated in honour of the duke of Cleves, threw a number of them, one of which, falling on a house, set it on fire, which rapidly communicating to other houses, reduced the greatest part of the town to ashes. Mortars which are generally believed to be a German invention, are said to have been actually made use of for military purposes in 1435, when Naples was besieged by Charles the 8th. But whether shells were then thrown out of them is uncertain. It is known, however, to a certainty, that shells were thrown from mortars at the siege of Wachenden, in Gelderland, by the earl of Mansfield, in 1588. Cyprian Lycas wrote upon the method of filling and throwing shells, in his appendix to the colloquies of Tartaglia, printed at London in 1598, in which performance, the method of compounding and throwing carcasses as well as various sorts of fireworks, is also shown.

Mr. Maker, an English engineer, is said to have first taught the French the method of throwing shells, which they practised at the siege of Lamothe in 1634. Mortars, however, have been long made use of, chiefly for throwing hollow balls, called shells, filled with a sufficiency of powder for bursting them, which, falling on any building, or into the works of a fortification, or among troops encamped, forming in order of battle, in column, or landing from vessels or boats, &c. are burst or broken by the force or explosion of the powder in them into a number of pieces or fragments, which, flying in all directions, occasion trepidation and confusion, and are destructive to every thing within their reach. They are also frequently made use of for throwing carcasses, which are a sort of shells with five holes filled with pitch and other combustibles, in order to set fire to buildings. Bullets filled with stones about the size of a man's fist, or of hand-grenades, are sometimes thrown from them during a siege into the covert-way, on the men employed in defending it. The ingenious general DeGouloguins contrived a method of throwing bags from them filled each with from four to six hundred shot of different dimensions. The effect of such an application of them, by pouring down shot somewhat like a shower of hail on spots three hundred feet at least each of them in circumference, must be awful and tremendous to troops moving in column, forming in line of battle, palling a deile, landing, &c. &c.

Mortars are, in this country, commonly distinguished by the diameters of their bores. Thus a thirteen inch mortar, a ten inch mortar, and eight inch mortar, are those which have the diameters of their bores respectively equal to thirteen, ten, and eight inches. These are the three largest sized mortars employed by us for land service. Besides them there are two smaller sized forts of mortars, one of which is called a royal, having the diameter of its bore equal to 5.62 inches, and the other a cohorn, taking its name from its inventor, Mr. Coehorn, the celebrated engineer, and having the diameter of its bore equal to 4.52 inches.

The principal part of a mortar on the outside, (see fig. 4.) are, A the charge, including the muzzle, B the reinforce, C the breech, and D the trunnions. The smaller exterior divisions are, the vent, the dolphins, the vent-arial and fillets, the breech-ring and ogue, the reinforce ring and ogue, the reinforce-arial and fillets, the muzzle arial and fillets, the muzzle-ring and ogue, and the shoulder.

The interior parts are, the chamber which receives the charge of powder, the bore where the shell is lodged, the mouth, and the vent.

The chamber is formed variously by different nations. The Spaniards chiefly use the spheric; the French, the Germans, and the Dutch make use of various forms for it, as the conic, the cylindrie, the bottled or the concave; the Portuguese the parabolic, and the English have usually made it in form of a frustum of a cone. No very satisfactory reasons, however, have been assigned for this variety.

Mortars are made of brass, iron, or steel.

Land-mortars are those that are used in sieges and on other land service mounted on beds. Both their and their beds are transported on truck-carriages. There is also a kind of land-mortal invented by count Buckeburg, which is mounted on a travelling carriage, and may be elevated to any degree at pleasure.

Sea-mortars are those that are made use of for sea-service, such as the bombardment of places by water, &c. As the objects they are fired at and intended to destroy are generally at greater distances from them than those to which land-mortars are required or expected to throw their shells, they are somewhat longer than them and much heavier.

Partridge-mortar is a common mortar surrounded by thirteen other little mortars bored round its circumference in the body of the metal. The large mortar in the centre is loaded with a shell, and the others with grenades. When it is fired by the vent the fire is so communicated at the same time to the small ones, that both the shell and grenades go off at once. The French used them in the war of 1701, at the defence of Bouchain, in 1702, and at the siege of Lille, in 1708.

Hand-mortars were frequently made use of before the invention of coehorns. They were fixed to the ends of flaves about four feet and a half long, of which the other ends were fixed with iron for sticking them in the ground. A bombardier elevated one of them at pleasure with one hand, whilst he fired it with the other.
CANNON.

The dimensions of brass land-mortars now made use of in our service are the following.

<table>
<thead>
<tr>
<th>Diameter of the bore</th>
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<tbody>
<tr>
<td>Total length of the mortar</td>
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<tr>
<td>Distance from the muzzle to the reinforce</td>
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<tr>
<td>The length of the reinforce</td>
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<tr>
<td>The length of the trunnions from end to end</td>
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<td>Diameter of the trunnions</td>
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<td>The length of the bore</td>
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<td>Greatest diameter of the chamber</td>
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<td>Least diameter of the chamber</td>
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<tr>
<td>The diameter of the muzzle-ring</td>
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<tr>
<td>The breadth of the muzzle-ring</td>
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<tr>
<td>The breadth of the allragals and fillets</td>
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<td>Their distance from the muzzle-ring</td>
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<td>The diameter near the muzzle allragal</td>
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<td>The diameter near the reinforce</td>
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<td>The diameter of the reinforce</td>
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<td>The breadth of the oggee</td>
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<tr>
<td>The diameter behind the breech-allragal</td>
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</table>

Chambers contain powder | - | - | - | - | - |

It is proper to observe, that the extremity of the bore next to the chamber is made round, and formed by an arc, which has its radius equal to that of the bore, and is terminated by the lines that form the chamber. The bottom of the chamber itself is semicircular. And the outside of the metal is determined by a circular arc described from the same centre as the bottom of the chamber, and touching the lines drawn parallel to its sides.

By means of these data, and the foregoing dimensions accurately delivered, such mortars may easily be constructed from the plate which exhibits the form of one.

The following are the dimensions of the sea-mortars that are used at present in our service, (see figs. 5. and 6.), which are of two sizes only, viz. of thirteen inches and ten inches bore.

| The diameter of the bore | 13 | 10 |
| The whole length of the mortar | 63 | 56 |
| The distance from the muzzle to the reinforce | 21 | 20 |
| The length of the reinforce | 18 | 14 |
| The length of the bore | 24 | 30 |
| The length of the chamber | 21 | 15 |
| The greatest diameter of the chamber | 8.5 | 6.6 |
| The least diameter of the chamber | 7 | 6 |
| The breadth of the muzzle-ring | 3 | 2.4 |
| The breadth of the muzzle, oggee, and fillet | 1.9 | 0 |
| From the muzzle to the allragal | 0 | 0.4 |
| The breadth of the allragal | 0 | 1.6 |
| The breadth of the reinforce ring | 1.9 | 0 |
| The breadth of the allragal next to the reinforce-ring | 4.5 | 2.2 |
| The breadth of the chace-ring | 1.5 | 0 |
| The breadth of the chace-oggee | 2.2 | 0 |
| The breadth of the chamber-allragal | 0 | 1.6 |
| The thickness of the metal at the muzzle | 4.7 | 2.8 |

The thickets of the metal at the muzzle-ring | - | - |
| The thickness of the metal near the reinforce | - | - |
| The thickness of the metal at the reinforce | - | - |
| The thickness of the metal behind the reinforce | - | - |
| The length of the trunnion from end to end | - | - |
| Its greatest diameter | - | - |
| Its least diameter | - | - |
| Length or the part diminished at each end | - | - |

The chamber contains powder | - | - |

The thickness of the metal at the muzzle-ring is determined by a circular arc described from the same centre as the bottom of the chamber, and touching the lines drawn parallel to its sides. And in the thirteen-inch mortar it is described from a center about three inches and a half nearer to the end of the mortar than that from which the bottom of its chamber is described. And in both these arcs ought to touch right lines drawn parallel to the sides of the chambers.

The invention of Howitzers is of a much later invention than that of mortars. The Howitzer is, however, one of the most useful pieces of artillery, as it can be employed on most occasions either as a cannon or mortar, and is easily moved by an army from place to place. It has its trunnions nearly in the middle, and is mounted on a carriage like a travelling gun carriage. The ten-inch howitzer is the largest in our service, and is not much made use of. It has been
The dimensions of the eight inch howitzer that we now use. 

The diameter of the bore = 8
The distance from the muzzle to the reinforce =
The length of the reinforce = 18.7
The whole length of the howitzer = 28.4
The length of the bore = 25.9
The length of the chamber = 9.8
The greatest diameter of the chamber = 4.6
The least diameter of the chamber = 4
The breadth of the muzzle ring = 1.25
The distance from the muzzle ring to the atragal = 4.6
The breadth of the atragal = 6.7
The breadth of the ogee before the reinforce = 1.4
The breadth of the ogee behind the reinforce = 0 or it has none.
The breadth of the atragal behind the reinforce =
The breadth of the atragal =
The breadth of the atragal =
The thickest of the metal at the muzzle = 2.25
The thickest of the metal at the muzzle ring =
The thickest of the metal near the reinforce = 3.4
The thickest of the metal at the reinforce = 3.4
The thickest of the metal behind the reinforce = 2.5

<table>
<thead>
<tr>
<th>Diameter of the bore divided into 30 equal parts</th>
<th>Diameter of the bore divided into 30 equal parts</th>
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</table>

The weight of the mortars equal nearly to

Without
Without attempting, as we have already observed, to demonstrate the principles of this general construction, he tells us that he has endeavoured to dilate, distribute, or arrange the metal in such a manner, as to make the relative degrees of strength in the different parts proportional to the forces which act upon them. He thinks the thickness of metal at the chamber sufficient, as it exceeds by two parts the diameter thereof, which is more in proportion than what is ever allowed to any brass gun whatever. He observes that though the mortar on the outside ought to be conical from the chamber to its mouth, to suit the action of the powder, he has, in compliance with common practice, given it a reinforce full sufficient to admit of an ogive.

He tells us he does not pretend to determine the true position of the vent, though he had always found that the nearer it was placed to the bottom of the chamber, the farther the mortar threw the shell with a given charge of powder. As he made these experiments, however, with only a three-inch mortar, he apprehends that no just conclusions can be drawn from them with regard to mortars of a larger size.

He delivers it as his opinion, that the cylindric figure is the best for the chambers of such mortars, observing, that though the bottlenecked or conical chambers, or those which have the smallest entrances, will throw shells farther than any other; yet in those which require but little powder, their entrances would be too narrow, and it would be troublesome to clean them; whereas, when they are cylindrical, they are very nearly as advantageous for throwing shells without being subject to these inconveniences.

He informs us, that lie and general Desaguliers made several experiments with chambers of different forms or figures, which contained the same quantity of powder, and uniformly found, that the cylindric threw the shell farther than any other, of which the entrance was larger, particularly when they were not quite filled; that they also made some experiments with cartridges of common writing paper holding charges of powder only equal respectively to half the content of the chamber, and found that when such a cartridge was so placed in the chamber as to be close to the shell, leaving a vacancy between it and the bottom, it threw the shell nearly twice as far as it did when it touched the bottom of the chamber, and left a vacancy between itself and the shell; that these experiments were repeated several times, and always gave the same result. He also informs us, that on filling the chamber partly with powder and putting a piece of common writing paper upon it, he found that the shell went much farther than the same charge without paper threw it; that they likewise made repeated experiments with a cylindrical chamber, and a conical one of the same length and content, that had its diameter at the bottom equal only to half that at its entrance, and observed, that when these chambers were not quite filled, the cylindric alone uniformly threw the shell much farther than the other did.

The first sort of mortars in this general construction, or those of which the weights are expressed by \( \frac{5}{6} d^3 \), have the same lengths which the land mortars have that we now make use of. The second, or those of which the weights are expressed by \( \frac{2}{3} d^3 \), are of the same lengths with those the French have been in the practice of using. And the third sort, that have their weights denoted by \( \frac{3}{5} d^3 \), are shorter than either. In each of them the chamber is cylindric, and the bottom of it a hemisphere. And the sound part of the mortar is described from the same centre as the bottom of the chamber.

In his general construction for sea mortars, the dimensions are the following. See fig. 9. Our sea mortars, as we have already observed, are of two sizes only, viz. of 15 inches and 10 inches.

<table>
<thead>
<tr>
<th>Diameter of the bore divided into 30 equal parts.</th>
<th>Diameter of the bore, divided into 30 equal parts.</th>
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</thead>
<tbody>
<tr>
<td>75 inch parts</td>
<td>75 inch parts</td>
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<td>( \frac{d^3}{120} )</td>
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<tr>
<td>( 2.1 \times d^3 )</td>
<td>( 1.8 \times d^3 )</td>
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</tbody>
</table>

The arc which determines the round part of each mortar is described from the same centre which the arc, that determines the bottom of the chamber, is described from.

The weights of our present sea mortars, and the quantities of powder which their chambers contain, compared with those which these constructions give, will stand as follows.

The
The diameter of the bore - - 11
The weights of our present sea-mortars - - 82 cwts. 0 qr. 0 lbs.
The weights of sea-mortars by the first of these constructions = 0.08 x d
The weights of sea-mortars by the second of these constructions expressed by 1.8 x d
The quantities of powder, which the chambers of our present sea-mortars contain

<table>
<thead>
<tr>
<th>Diameter of the Bore</th>
<th>Inches</th>
<th>In the Second Construction</th>
<th>Inches</th>
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Besides these kinds of mortars for throwing shells and carriages, there is another sort of mortar for throwing stones either by the besieged from the body of the place, the outworks, or covert way into the besiegers approaches on the glacis, &c. or by the besiegers into the covert ways as they approach the same. There are no such mortars employed in our service; because hand-grenades, or small shells thrown from a common mortar with small charges of powder, answer the purpose intended much better than stones.

The following, however, are the dimensions of a fifteen-inch stone mortar, supposing the diameter of the bore to be divided into thirty equal parts. See fig. 12.

<table>
<thead>
<tr>
<th>Diameter of the Bore divided into 30 equal parts</th>
<th>Inches</th>
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<tbody>
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</table>

The length of the bore - - 37 such parts
The length of the chamber - - 16
The greatest diameter of the chamber - - 8
The least diameter of the chamber - - 6
The diameter of the cylindric part to hold a wooden tompon - - 14
The depth or axis of that cylinder - - 3
The distance from the muzzle to the reinforce - - 20.5
The length of the reinforce - - 8
The thickness of the metal at the muzzle - - 3.5
The thickness of the metal at the reinforce - - 4.5
The thickness of ditto at the chamber-belt - - 9
The thickness of ditto at the entrance of the chamber - - 6
The chamber enters into the trunnions by - - 2
The breadth of the muzzle-ring and fillets - - 3
The breadth of the chamber-belt is equal to - - 2
The breadth of the oggee next to that belt - - 3
The cube of the diameter of the bore - - d^3
The quantity of powder in lbs. which the chamber contains - - d^3 / 1102
The weight of the metal contained in this mortar - - d^3 / 318

The dimensions, according to his construction, of howitzers of three different weights, with the same bore, are the following. See fig. 10.

<table>
<thead>
<tr>
<th>Diameter of the Bore divided into equal parts</th>
<th>Inches</th>
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The length of the howitzer - - 2.25 d^3
The quantity of powder in lbs. - - d^3 / 1102
The weight of the howitzer - - d^3 / 318

The length of the caissons is equal to 24 such parts, the radius of the button to 8, and the oggee with the fillet included is equal to 4.

It is somewhat surprising that howitzers are not more made use of than they are even in the field. For they may be employed successfully for throwing, not only large shells, but large, solid, or cored shot, either point blank, or with small angles of elevation, and with charges of powder suited to different ranges and grazing distances to the great annoyance of the enemy. They are also much fitter than guns for discharging grapes of small shot and small shells from short distances at close quarters, and are peculiarly calculated for sweeping or scouring the covert way along its several branches with shells fired en ricochet. No earthworks are proof against them when a judicious use is made of them. Even at sieges, when the works have revetements, or demi-revetements of masonry, as soon as the walls which support the earth of the rampart and parapet are
are battered down, there is no speedier or more effectual way of completing the breaches and rendering them practicable than by throwing shells into the earth where it is hard of mastery. For they lodge or bury themselves in it, and burrowing operate as small mines.  

Fig. 11 represents a mortar with a bottled or concave chamber, the diameter, $ab$, of the entrance of which is a third part of the diameter of the bore. The distance from $ab$ to $cd$ drawn parallel and equal to it in the longitudinal section is equal to twenty-six inch parts as those, of which the diameter of the bore contains thirty. The conjugate diameter of the chamber is equal to twenty six parts. The form of the outside of the mortar, where the chamber is, is similar to that of the chamber itself. The thickets of the metal at the chamber is equal to fifteen inch parts, and all the other dimensions are the same as in the first construction for mortars above.  

As the entrance of the chamber has its diameter equal to a third part of the diameter of the bore of the mortar, it is large enough in one of either thirteen or ten inches for admitting a man's hand to clean it without inconvenience, and may therefore be loaded without difficulty.  

Besides these pieces of ordinance, there is another, that is now pretty generally used, and is called a carronade, from a foundry that has for a considerable time been carried on by a company under the name of the Carron company, on the banks of the river Carron in Scotland. The carronade is a gun of a fort intermediate length and weight between the cannon and the howitzer, and not a very short howitzer, as the celebrated Dr. Hutton has inadvertently observed in his Mathematical Dictionary. The first howitzer, propeller, or inventor of it was the present learned and ingenious General Robert Melville, so well known for his talents as a military antiquarian, and the discoverer of the temporary Roman camps in North Britain. He at first suggested that not only solid but shell shot might be thrown from it, and afterwards that it might be employed for throwing carcasses and cored shot. The first gun of this nature was cast and constructed according to his suggestions at Carron in 1779 after a rupture with France, and during the American war. The operation was performed under the directions of that very able founder, Charles Galcoigne Esq., then director of that foundry.  

The diameter of its bore was equal to eight inches, having the same caliber with an eight-inch mortar or howitzer.  

The length of its bore including the chamber was equal to six diameters of the same very nearly, or to six times its caliber or four feet.  

The diameter of its chamber was equal to the caliber of a forty-two pounder gun, and contained five pounds and a half of powder.  

Its weight was nearly equal to that of the navy twelve pounder gun, being equal to 31 cwt.  

The boat was cast in an eight-inch spheric iron mould, and the windage was formed by the retreat or shrinking of the metal of the shot in cooling, which when cold weighed about 68 pounds, or about four pounds less than a solid iron shot or ball eight inches in diameter, which weighs about 72 pounds very nearly. From this circumstance it came to be called a 68 pounder, though its original propoer or inventor gave it the name of a smaller from its effects, particularly when fired with shot at timbers or wooden work. It was at first designed for a ship gun. And there is now in the possession of General Melville a small model of it mounted on its carriage on a small platform, to one end of which is fastened a wooden representation, in miniature, of part of a ship's side, with a port, and the following inscription in brafs, let in on the top thereof.

"Gift of the Carron company to Lieutenant General Melville, inventor of the smaller and better carraonades for solid, chip, shell, and cored shot, &c. first used against French ships in 1779."

In the middle of the lower carriage there is a longitudinal groove, along which the gun on its upper carriage rolls. And when so mounted, it may be pointed in any angle less than forty degrees either to the right or left of this groove. A port or embrasure large enough for a 24 or 32 pounder gun is also sufficiently large for receiving the smaller or 68 pounder carronade.

Several experiments were made with one of this calibar the same year, viz. in 1779, at Carron, in the presence of Sir Adolphus Oughton, K. B. then commander in chief in Scotland, General Melville, and many other officers, some of whom were of the corps of artillery and engineers, with much success, both in regard to the projectile force, with which the shell-shot were thrown, and not only the practicability but also the certainty of their producing powerful effects, by hurling wherever they should penetrate, as perfectly convinced Sir Adolphus and all the rest, that in all the cases, which might be many, by sea as well as by land, for the use of this species of artillery, the introduction of such pieces of ordnance both into his Majesty's naval and military service would be of the greatest utility and advantage. Sir Adolphus thought it therefore his duty to transmit to government a fair and candid report of the experiments he had seen made, and a statement of the advantages which he conceived might be obtained by a judicious and proper use of such guns. It happened, however, that no encouragement was then given to the introduction of this species of cannon, though it was so respectably recommended and approved by intelligent profissional men, because it was regarded as a novelty, an innovation, and a departure from common haxked practice and customs, by which public boards, that are but rarely composed of individuals of the first talents, liberality, and information, are for the most part too studiously governed. The proprietors of the Carron foundry, however, were advised to try whether pieces of smaller dimensions, cast and constructed on the same principle, would not meet with a sufficient sale for private vessels of war, as letters of marque and reprisals, and perhaps for some of the royal frigates. They made the trial, and succeeded. For besides a pretty frequent demand that was made for them during the remainder of that war for the use of the two former descriptions of vessels, on account of the great advantages they were found in practice to possess over common guns of the same weights, and much smaller calibers, there were some of the larger fort or of 8 inches caliber, called carronades by the original propoer, introduced by degrees into the navy.  

Two of the naval officers, who first made use of them on board their ships, were Captain Keith Elphingstone, now Admiral Lord Keith, and Captain Henry Trollope, now Sir Henry Trollope, the latter of whom, in a most remarkable instance, by means of two carronades which he had on board his frigate, beat off several of the enemy's, who were panic-struck on viewing the size of some of the shot he fired into them.

Soon after the commencement of the royal war against France, in which Great Britain engaged early in 1793, carraonades of various dimensions, but few of the larger size, or smallers, improperly called 68 pounders from each of their solid iron-balls, which are not near so fit for sea service as hollow or cored shot of the same diameter, but much lighter, came rapidly into use in our ships of war and other armed vessels, and often proved to be of the greatest utility and adv.
vantage. They have ever since been reckoned so useful, that there is now hardly a ship in our navy or an armed vessel, that is altogether without them.

When the carronades were first introduced, they were meant chiefly for the defence of merchant ships, and were calculated, by their construction, to be of such lengths and weights as might be convenient for the sizes of the vessels that were to carry them, supposing each of them to be loaded with a twelfth part of the weight of the shot, as the service-charge of powder. The Board of Ordnance was pleased to order a number of them for the navy: and their first warrant for about 1500 of them was completed before Mr. Gascoigne was certainly informed that the board had fixed on one-ninth instead of a twelfth part of the weight of the shot as the charge of powder for service. These were therefore reckoned both too light and too short for the navy. And on the Board's afterwards ordering 20 carronades of each of the natures of 12, 18, 24, and 32 pounders, he very naturally took the liberty of adding both to the length and fortifications of each of them, so as to increase its strength and power of resistance to burtiling, in proportion to this perhaps ill-judged addition to the charge of powder, substituting also a screw instead of the quoin or wedge. Forty of them were proved at Woolwich, and were afterwards rejected on account of these very improvements.

The late colonel Frazer, of the engineer corps, made a number of experiments at Leith with a smaller, or 68 pounder carronade, both with its own solid shot and with common eight-inch shells, which were corroded by rust, and, independent of that circumstance, had by far too much windage. And it is worthy of remark, that notwithstanding this, the shells went farther than the solid shot before they met the surface of the earth or of the water, or had their first grazes greater when the gun was fired, either horizontally or point blank, or with any elevation not exceeding two degrees, but that with any elevation from two degrees upwards the solid shot went farther.

The following is an exact statement of experiments made at Languard fort on the 27th and 28th of July, 1780, by order of marquis Townshend, and master-general of the ordnance, and comparative trials with a ten and eight-inch howitzer.

Practice with a 68 pounder carronade, or smaller.

The weight of the piece in cwt. qrs. lb. 29 0 6.

The length of the piece in feet and inches, from the hind part of the base ring to the muzzle, 3 11 1.

The length of the bore, chamber included, 3 11.

The diameter of the bore, 8 inches.

The nature of the rope for breeching, 2 1 inches.

The length of the recoil, in feet and inches, 12 3.

Weight of the solid shot, 68 lb.

Weight of the shell shot, 57 lb.

<table>
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<tr>
<th>Time when.</th>
<th>Rounds</th>
<th>Weight of Powder</th>
<th>Diameter of Shot</th>
<th>Weight of Shell</th>
<th>Windage</th>
<th>Elevation</th>
<th>Time at First Fall</th>
<th>Grazes</th>
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A 10 inch brass howitzer, weighing 23 cwt. 3 qrs. and 7 lb. fired horizontally, or point blank, with five pounds of powder, had its first graze at the distance of 172 yards, with one degree of elevation at 250 yards, with two degrees of elevation at 300 yards, and with three degrees of elevation at 414 yards.

When fired horizontally, or point blank, with six pounds of powder, it had its first graze at the distance of 80 yards, with one degree of elevation at 225 yards, with two degrees of elevation at 290 yards, and with three degrees of elevation at 445 yards.

An eight-inch brass howitzer fired horizontally or point blank with two pounds of powder, had its first graze at the distance of 119 yards, with one degree of elevation at 195 yards, with two degrees of elevation at 200 yards, and with three degrees of elevation at 246 yards.

When fired horizontally or point blank with three pounds of powder, it had its first graze at the distance of 125 yards, with one degree of elevation at 208 yards, with two degrees of elevation at 278 yards, and with three degrees of elevation at 336 yards.

The recoil of the ten inch howitzer fired horizontally or point blank was 11 feet with 5 pounds of powder, and 13 2 feet with 6 pounds of powder.

The recoil of the eight-inch howitzer fired horizontally or point blank with 2 pounds of powder was 10 feet, and with 3 pounds of powder 16 feet.

An iron 24 pounder, of the late lord Howe's construction, fired with six pounds of powder and one degree of elevation, had
had its first graze, on a medium of four trials, at the distance of 4713 yards; and with five pounds of powder and the same elevation, on a medium of two trials, at 5075 yards.

A 32 pounder iron gun fired horizontally or point blank with high shot and four pounds of powder, had its first graze at the distance of 200 yards, with the same shot, charge, and one degree of elevation at 405 yards, and with two degrees of elevation at 675 yards.

And the same gun with the same charge, point blank, and the same elevations, but with low shot, gave the first grases at 220, 395, and 665 yards respectively.

These experiments clearly prove the great superiority of the smaller, or 68 pounder cannonade, over not only the eight-inch howitzer of the same bore with it, but also over the ten-inch howitzer, which is the largest in our service, and has its point of failure at 100 to 641 and the diameter thereof to that of the smaller as 10 to 8.

They also shew, that it is nearly on a footing with the common iron 24 and 32 pounder, as to its first grazing distance, which is a material point in sea-service, and has greatly the advantage of them, particularly in close combat, by the size of the holes which its shot make in the side of a ship, and from their likewise passing through the same with less velocity. For a shot, especially if its diameter be but small, that passes very quickly through a ship's side, makes only a clean hole, whereas one of a large diameter, that penetrates it with less celerity, makes a rough and ragged one, by tearing and splintering the planks and timbers. And it is well known that shot fired at sea with a greater elevation than five degrees, are of no use whatever, unless they hit the object they are fired at before they meet the surface of the water, as they never graze or rise again from it when fired with so great an elevation. It may be objected to the use of smallers on board a ship, that their shot are too heavy to be easily handled and put into the gun. This objection holds good against the use of them with their shot in its solid form, which of all others is the most unfit for sea engagements. It vanishes, however, when it is considered that the weight of its shot may be reduced by leaving it hollow, or with a core in the centre, from 68 pounds down to 34 pounds and under, and still retain thickness and strength of metal enough for penetrating the side of any ship whatever. This fact has been established by even the possibility of controversy by some experiments that were made at Woolwich in 1781, in the presence of general Melville who proposed them, and his grace of Richmond, then master-general of the ordnance. For in July that year Mr. Gofeigne sent from Carron to Woolwich for that purpose fix hollow smaller, or 68 pounder cannonade shot, weighing from 55 pounds to 551/2 pounds, six others reduced in weight from 68 to 50 pounds; six others weighing only from 43 to 40 pounds, and six reduced down from 41 to 32 pounds so low as from 43 pounds to 40. The lightest of these were fired into a bulk-head, as thick as the side of a first rate, from a suitable distance. They easily penetrated it, and one of them, after penetrating, striking against an oak poll or fluid, nine inches square, tore, shattered, and splitted it amiss to pieces. The master-general, after viewing its effects, said it would have been a terrible shot against a ship, and very judiciously observed, that as the lightest of these hollow shot were found to answer perfectly, it was unnecessary to try the heavier ones. We are convinced, indeed, that the shot of a smaller, or 68 pounder cannonade might, by means of concentric cavities, be reduced down to the weight of 32 pounds, and still retain strength and thickness of metal sufficient for penetrating the side of any ship. In this state they would be much more easily handled than a common 32 pounder shot, having a larger diameter and a much larger surface. These experiments shew, that they are sufficiently strong for that purpose when brought down to within eight pounds of that weight. And if, in addition to this fact, it be also taken into consideration, that a multitude of experiments made with smallers, or 68 pounder cannonades, concurred in establishing this point, that when fired either point blank or with any elevation not exceeding two degrees, the hollow shot went farther than the solid shot before they met the surface either of the ground or water, it must readily be allowed, that they are peculiarly calculated for naval combats. But were these hollow shot to be fired as shells, with a sufficiency of powder in their cavities for burying them, they would be truly terrible and tremendous to shipping in a sea-fight. It may be alleged, that the enemy would soon also get into the use of them as shells. It is true that after a time he might: but however shall make this use of them in a great naval action, he will certainly derive infinite advantages from it. And we trust our enemies will not be the first to make such an application of this very useful piece of ordnance.

Of the position of the vent in cannon, and other pieces of ordnance.

Also the inflammation of fired gunpowder is almost instantaneous, it is natural to conclude, that the impulsive force of a given charge of it is not, ex parte, sensibly altered by its being fired in any particular part or point of it; and of course, that neither the initial velocity nor range of a ball is sensibly affected by the position of the vent. This is a fact that has been sufficiently established by experiments made at Woolwich, by the learned Dr. Hutton, and several respectable officers of artillery, under the authority and direction of the board of ordnance.

The vent is vulgarly called the touch-hole; and is the narrow cylinder or opening through which fire is conveyed from the outside of the piece to the powder that composes the charge.

Formerly both theorists and practitioners differed widely from one another in regard to the proper position of it. It has been customary to place it from one quarter of an inch to half an inch from the bottom of the chamber or bore, and sometimes a whole inch. An idea prevailed, that if the vent were directly opposite to the middle of the charge, the powder would be inflamed in less time than in any other place, and that the explosion would of consequence produce a greater initial velocity and range. This erroneous conclusion was founded on the supposition that if a tube were filled with powder and lighted in the centre, the powder would be burnt in half the time that it would be lighted at either end, and on inadverted to this circumstance, that the inflammation of fired gunpowder is so nearly instantaneous, that no sensible difference as to the time in which it takes place can arise, from the firing of a charge in the centre in preference to any other part of it. In order to determine this point, Frederic the Great, or the Second, of Prussia, ordered a light three pounder to be cast with three shifting vents, one at the centre of the charge, one at the bottom of the bore, and the other at an equal distance from the bottom and centre one; so that when one was used the other two might be flopped up. The gun weighed 2 cwt. 1 qr. 20 lb. Its length was three feet three inches, and the bottom of the bore, instead of being rounded, was quite flat. It was loaded each time with one quarter of the shot's weight of powder. It was found that when the lowest or bottom-vent was used, the ranges were rather the greatest, and that they were somewhat less as the vent was more and more distant from the bottom. The differences, however, were so small, that they might very easily have been produced by the least inaccuracy in making the experiments, or by the gun's being a little more heated at the time of making
Cannon.

making one than another, and but little reliance can be placed
on them.

On the form or figure of the chamber of a piece of ordnance.

The chamber of a gun, mortar, or howitzer, is the cavity
at the bottom of the bore, that receives the charge of powder,
and communicates with the vent, through which the
fire of the priming is communicated to the same. There
are but few guns that have chambers, except some of the
larger sizes and calibers, as it has been found by experience,
that they have scarce any sensible influence or effect on the
velocity of the shot in small and middle sized ones.

Various have been the opinions of authors and artilleryists
respecting the forms or figures of chambers; and different
nations have had them constructed very differently. The
Spanish have been in the practice of using chiefly the
spherical chamber for their mortars; the French, Germans,
and Dutch, the conic, cylinidrical, and the concave, or
bottled, or the chambre à pois, or pear chamber. The
Portuguese have made use of the parabolic form, which was
first suggested or invented by comte de Lippe Buckeburg.
And the English have been in the habit of making theirs in
the form of a frustum of a cone.

The cylindric chamber is that which is equally large every
where, or has the diameter of its bore in every place or part
of it the same. This is found to be by far the most
commodious form for great guns or cannon of a large caliber,
and is indeed almost the only kind of chamber that is made
use of in such pieces of ordnance.

The spheric, or spheroidal chamber, as its very name im-
paints, is that which is made in the form of a sphere, or bul-
et, or at least very nearly so. This sort of chamber for
guns, or cannon, was invented towards the close of the fe-
venteenth century. The object of this invention was to
throw balls and shot with as much force from short, light
and easily transportable cannon as that with which they
were thrown from the long, cumbersome, and ponderous
pieces then in use. It was found by experience, that the
advantages expected and proposed were obtained by this
alteration in the interior arrangement of the bores of guns,
or by the construction of such pieces. For though they were
made a good deal shorter than those formerly made use of,
and were fired with a smaller quantity of powder, they pro-
duced the same effects. But as it was difficult to wipe, or
clean out the interior cavities of such chambers after the
cannon were fired, some fire frequently remained in them, which sometimes occasioned the loss of arms to the
cannoniers, or the persons who were employed to serve and
manage them. Besides these inconveniences, they were at-
tended with others; for the inflamed powder, before it quitted the chamber, acted in all directions with such force
and impetuosity, that their carriages were soon either
broken or rendered unserviceable. They receded very much
and fired with little certainty. For these reasons, guns
with spheroidal chambers were totally laid aside; and soon of
them as were found in the arsenals and fortresses in France
were cast again into cannon, having cylindric bores every
where equal and alike. The guns commonly made use of
at present have no chambers, except some of the largest
calibers. And even these have their chambers cylindrical.

The very ingenious Mr. Robins in the scholium to the
ninth proposition in his new principles of gunnery affords,
that what some authors have advanced in regard to the ad-
vantages of having particular forms for the chambers of
mortars and cannon, is altogether inconclusive, and founded
on erroneous conceptions of the action of fired gun-powder.
The learned Mr. Euler, however, in his commentary and
remarks on Mr. Robins's treatise, contends for the spheroidal
chamber as the best. He admits that Mr. Robins's con-
clusion would be true did the inflammation of the powder
take place in an infant. He allows, that the force of the
powder on the supposition of its firing instantaneously would
be the same, whatever be the form of the space behind the
flot or shell that contains it, and whether this space be ei-
ther wholly or only partly filled with it. He also allows,
that its impelling power after the ball or shell is once in
motion, will in this case be the same, as well as its first
impulsive force, whatever be the form of the chamber; that if
no better reafon than the increafing of the impelling force
can be allotted for changing the figures of chambers, either
in guns or mortars from all proposi-
tions for altering them, except such as tend to render them
more convenient and commodious, ought to be rejected with-
out further examination.

Leaning, however, towards an opinion of professor Ber-
noulli, that the elastic force of the fluid generated by the
explosion of gunpowder, is nearly ten thousand times greater
than the pressure of the atmofphere, he supposes the in-
flammation of gunpowder to be gradual instead of being al-
moft instantaneous, and therefore concludes, that chambers
may be improved by changing their figures, and that the
spherical form is the best of all, as being capable of holding
the greatest quantity of powder under the fame circum-
ference, as better calculated than any other for keeping the grains
near, or contiguous to one another, and for quickening,
or accelerating the explosion. The experiments which he ap-
peals to, and produces for establishing this hypothesis, are
altogether inconclusive, and must have been conducted with
great inaccuracy, or intention to some circumstances that
were conected with, and influenced them. They were
made in preference of him, Mr. Bernoulli, and several other
members of the academy at St. Petersburg, by general Gun-
ther in 1728. And from two of them he infers, that a ball
fired vertically with eight ounces of powder from a piece,
which had the length of its cylinder equal to 77 English
feet, slipped out of it with three velocities which it affixed
with, fired with the same quantity of powder from the
same piece, when the length of its cylinder was reduced to
six feet, by having one foot and seven-tenths of a foot off
from it. Taking this inference too precipitately for granted,
he observes, by way of proving the great inaccuracy of Mr.
Robins's position, "that all the powder of the charge is
fired and converted into an elastic fluid before the bullet is
famously moved from its place;" that according to this the-
ory, the velocity instead of being thrice as great would have
differed from the other three perceptibly, and therefore
most erroneously concludes, that the greatest part of the
powder must have fired whilst the ball moved through the
half font and a half of the bore of the piece, before it was
reduced in length. Now, the quadruplicate ratio of $7 + \frac{7}{9}$
to 6, or of 77 to 60, is that of $35,153,540.14$ to $12,960,000$,
which is considerably less than the ratio of three to one. Mr.
Euler then makes the velocities of the same, or equal shot
fired with the same charge of powder from bores of the fame
diameter, but of unequal lengths in ratios to one another,
respectively greater than the quadruplicate ratios of these
lengths. We know, however, from experiments made
with incontestable accuracy at Woolwich on Mr. Robins's
plan improved, that these velocities are in ratios somewhat
lefs than the subduplicate ratios of the lengths of the bore,
but in ratios somewhat greater than the subtruplicate ratios
of the same lengths, and nearly indeed in mean or middle
ratios between the two. Mr. Euler's making the ratios of
these velocities ten times as great as they really are, proves
incontrovertibly both his theoretical reafonings, and his ex-
perimen-
experimental inference against the position of the almost in-
flammatious firing of gunpowder, and in support of the hy-
pothesis of its firing gradually in the way he describes, to be
completely erroneous.

The objections he endeavours to draw from rifled pieces
against the truth of Mr. Robinson’s seventh proposition, being
inconsistent with facts and experiments, are likewise fallaci-
ous and inconclusive.

A conical or conical chamber is that which is in the form
of a frustrum of a cone, with its bottom sometimes circular,
but generally hemispherical, or nearly so. We have been
in the habit of using such a form for chambers with the
greatest diameter of each at its mouth, or entrance, contrary
to reason and principles, which point out the advantage and
propriety of having the impulse of the inflammable powder made
on the shell or bullet as near to its axis, or to that of the
bore of the piece as possible.

Count Buckeburg proposed the parabolic form, or that
of a paraboloid, or parabolic conoid, which has been made
use of by the Portuguese as the best, erroneously supposing,
that were the line introduced to the focus, the rays of light
powder would by the nature of the figure be reflected into
parallel directions like the rays of light.

A concave chamber is that which has its mouth or en-
trance narrower than its inside cavity. It may be spheric,
spherical, in the form of a pear, called by the French, one
chambra poire, in the shape of an egg, of a bottle, and a
variety of other forms.

Much more, however, depends on the entrance of the
chamber, than on its form or figure. The entrance ought
to be directly opposite to the middle of the ball, or shell,
and to have no greater width than what is necessary for
cleaning out the chamber, which should contain no more
powder than the greatest charge proper for service, to pre-
vant as much as possible any vacancies being left between it
and the shell or bullet. As the cylindric is the most con-
venient form for being easily cleaned out, it ought to be
preferred to others on account of its simplicity. For, in
most of the affairs of life, and more especially in those of
war, of all things of the same kind, the simplest are the most
commodious.

Of the position of the charge of powder.

Every experiment that has been made respecting the posi-
tion of the charge of powder, proves the advantage of its
lying close to the ball or shell. Among others, the follow-
ing are well deserving of notice.

The ingenious general Deguignies in 1753, and Mr.
Muller, then professor of fortification in the Royal Military
Academy at Woolwich, made a number, repeatedly with a
small mortar, which had several shifting chambers.

Into a narrow cylindric chamber of about four inches
long, and holding about twelve grains of powder, there was
put a thin cartridge filled with six grains. This cartridge
was placed in the chamber in such a manner as to lie close
to the shell, leaving a vacancy or empty space between it
and the bottom of the chamber, and was fired by means of
a quick match, introduced through the vent. A cartridge
of the same size, and containing the same quantity of pow-
der, was then put into the fame chamber, but placed at the
bottom of it, leaving an empty space between the powder
and the shell, and was fired in like manner. Lastly, an
equal cartridge with the fame charge of powder was placed
in the middle of the fame chamber, or equally distant from
the bottom thereof and from the shell, and was fired in the
same way. These experiments were frequently repeated,
and it was found, on every repetition of them, that in the
frill case, the shell was thrown nearly twice as far as in the
second, and that the distance it went to in the third case,
was about an arithmetical mean between its ranges in the
frill and second.

They also found, that when the same quantity of powder
was put loose into the fame mortar, and a piece of writing
paper laid on it, the shell was thrown considerably farther
than it was by the fame charge of loose powder without the
paper.

They likewise found, that three cylindric shifting cham-
bers of different lengths, but holding the same quantity
of powder, produced, when filled, equal ranges, but that
when they were not quite filled, the longest gave the great-
est range.

They also tried some experiments with two chambers in
the form of a frustrum of a cone, one of which had its largest
diameter at the bottom, and the smallest at the entrance,
and the other its smallest diameter at the bottom and the
largest at the entrance, and always found, that the ball of
these with the same charge of powder, threw the shell far-
ther than the second.

General Deguignies also found by experiments, that
grained and mealed powder were about equally strong when
in good order and condition; but on putting a small phial
filled with water into the chamber amongst the powder, he
observed the strength of the charge to be considerably in-
creased.

Of the Windage.

The windage of a gun, mortar, or howitzer, is the dif-
ference between the diameter of the bore and the diameter
of the shot or shell. We have been in the practice and still
are, of making it equal to a twentieth part of the diameter
of the shot in every gun except the carronades. The Dutch
have commonly made their windage nearly the same as ours.
The French have been in the habit of making theirs a twen-
ty-sixth part of the diameter of the shot. And the Prussians
make the diameter of the bore of the gun to the diameter
of the shot as 25 to 24. This is a most convenient proportion.
But it makes the windage much greater than it ought to be.
There seems to be no very good reason, indeed, for making
the windage bear any given or determinate ratio to the di-
iameter of the shot, since if the bores be true, the same wind-
age that answers for a small shot will be sufficient, or nearly
so, for a large one. The smaller the windage, the greater
and truer will be the flight of the shot or shells; for when
it is great, they are apt to injure the bore by bouncing from
side to side, and also, at leaving it, to receive from this kind
of motion a sort of cant or deflection from the line of their
direction. With our present windage for guns, except car-
ronades, from one fourth to one half of the charge is lost
and rendered useless. Short guns, indeed, with small
charges of powder and a very small degree of windage will
be more useful and serviceable than guns twice as long with
double charges of powder and a large windage. We will
not undertake to determine precisely what the windage
ought to be. But we are inclined to think, that if the shot
and shells were cast in models having exactly the diameters
of the bores of the different pieces of ordnances for which they
are intended, the retreat or shrinking of the metal in cooling,
will for both leave a sufficiency of windage. The windage
we have been in the practice of allowing for shells of all
sizes, is a quarter of an inch, which is preposterously large
and beyond all due proportion. Were it reduced even to a
third or fourth part of that quantity it would be insufficient.

In our common 12 pounder, 18 pounder, 24 pounder,
32 pounder, and 42 pounder, there is allowed respecti-
ably a wind-
a windage of 0.22 inches; 0.22 inches; 0.27 inches; 0.305 inches; and 0.534 inches. But in our 12 pounder, 18 pounder, 24 pounder, 32 pounder, and 42 pounder caronades, the windage is only about 0.097 inches; 0.1 inches; 0.123 inches; 0.145 inches; and 0.166 inches respectively, which gives them a great advantage and saves much powder.

Of the casting and boring of cannon.

The casting of a gun in its first and limited sense is, the running of any fort of metal or mixture of metals, of which the gun is intended to consist or be composed, into a mould prepared for receiving the fame, and having its inside of such a shape, as to form the outside of the gun. But the casting of cannon in its more general acceptance, includes every thing, and operation preparatory to, necessary for, and connected with the forming of them, such as the making of the molds, moulds, &c., &c. for all which see the article Foundery.

Cannon, as we have already observed, were originally made of bars of iron fitted together lengthwise, or of sheets of iron rolled up and fastened together, and hooped with iron rings. They were ponderous, clumsy, cumbrous, in a great measure unmanageable, and could not be transported from one place to another with great difficulty and labor. They were chiefly employed for those late flames like the machine of the ancients, which the succeeded by bars cannon, which had much smaller calibers, and threw iron bullets instead of stones, but produced in a few hours greater effects than the others could in many days. These guns were first cast of a mixture of copper and tin, called gun-metal from that circumstance, which continued to be employed for that purpose a long time before cast iron was made use of. In the course of time, however, as the use of artillery became more general, and the number of cannon greatly increased, iron guns were invented by way of lessening the expense. An idea, however, that prevailed of their being very liable to burst when much heated by firing, retarded the general introduction of them into service, and was the cause of their being made much heavier than brass guns of the same calibers. And this apprehension strengthened by some accidents of the kind that took place either through improper management, or the carelessness and unskillfulness of some founders, has militated against the general use of them even down to the present time. When cast, however, with the iron obtained from good virgin ore, which the founders can give any degree of malleability, of which the Carron company and others have afforded many proofs and speciments, they resist bursting as much as brass cannon, and possess great advantages over them, as these are composed of ingredients, that melt with different degrees of heat, and are thereby not only liable to be soon injured when much heated, but also to be rendered in a short time totally unserviceable by quick and continued firing.

Till about 40 years ago, cannons were cast with a cylindrical cavity in each of them, having nearly the same diameter with the intended caliber of the piece, which was afterwards enlarged to the proper size by machines, one of these is represented. See Cannon, fig. 13. Two cast iron bars, A, A, were confined in a vertical position, by being ferreved to the four beams, B, C, D, E; between thefe bars a cast-iron frame, C, was at liberty to slide; to which frame the gun, D, D, was fixed by a band, e, across the base ring, fixed by two screws, another similar band, f, fixed across the chace, and two smaller ones, a, a, ferreved across the trunnions, to prevent the piece from turning round by the action of the drill-bar, E; a tin or copper pan, F, was fixed on the drill-bar for containing the chips of metal separated from the piece by the borer on the top of the drill-bar. After the gun was prepared by boring, by cutting off the cap or piece of metal at the muzzle with a saw, it was brought under the frame, C. The two blocks of pulleys, G G, were unhooked from the frame (which was let down and refixed on the bottom of the bars A, A), let down and fastened to the gun below, by chains, to hoist it up into the frame, C, where it was fixed by the screws; the pulleys were then hooked into the top of the frame, to raise it with the gun, high enough to introduce the borer; the pulleys were afterwards slackened, and the drill-bar, which worked in a socket in the ground, set in motion by horses or otherwise, the gun being kept to the work by its own weight; when the gun was bored far enough, it was prevented from descending any farther by the block, H, which was adjustable by screws, to the proper length of the bore; when the piece was bored, the pulleys were again unfixed to support it, while it was detached from the frame, and afterwards to lower it down.

Owing to the unequal contraction of the metal between the core and the outside of the mould, guns cast hollow were always more or less pouncy, and numberless cavities were formed round the core, some of which were too deep for the chasers, and other parts of the surfaces have occasioned the old method to be laid aside, and guns are now uniformly cast solid. The old machines also, where the gun was fixed, not being found to bore always in the right direction, several new machines have been substituted, some of which are represented in figs. 14, 15, 16, and 17.

Fig. 14, is a machine used at the Carron Iron Works. In this, contrary to the former one, the gun, B, is turned by the shaft, A, moved by a water wheel; the drill-bar, E, is advanced by a weight, C, acting on a bent lever, whose fulcrum is F; when the weight, C, has descended to the floor, or nearly, it must be lifted up, and the point, G, then acting as a fulcrum, the rod, H, will be drawn forwards, one or two teeth of the rack, J, and the weight will be ready to act again as before. The gun, B, is fixed by a square lump cast on the end of the caisable, into a coupling box, and wedged up, and the choice of the gun moves in a collar. The only guns cast at these works are caronades.

In fig. 15, the gun is fixed in the same manner as figs. 14 and 17, except that the box, K, is fixed by ferreves instead of wedges, the drill-bar, E, rests on a block, F, and when it is brought forward by the motion of the carriage, G, moving on wheels, a a, to diminish friction; to the bottom of the carriage, a rack, I, is fixed, working into a pinion, L, the rack is kept to the pinion by a roller, b; on the end of the axis of the pinion a capstan-head is fixed, with mortise-holes in it, to contain one end of an iron bar, d, while the other is loaded with a weight, C, for advancing the borer, and is shifted into a fresh hole as often as the weight descends to the ground.

In the machine, fig. 16, the muzzle of the gun can be elevated or depressed, to suit guns of different bores, by ferreves, e, between the two plates, a b; the plates can also be moved farther from or nearer to the coupling box, by a screw, d, to suit guns of different lengths; the two blocks, F G, between which the rack, I, is fastened, are fixed down to the beams, A, B; the pinion, L, is fastened to the block, M, which can slide between the beams, A, B, and has wheels above and below the beams, to diminish the friction; to this block, the end of the drill-bar, E, is fixed; near the other, it rests on the block, F; on the end of the axis of the pinion is a wheel, f, with teeth parallel to its axis, on the end of which axis the bar, g, is loosely fitted; to the other end of
of the bar the weight, \( c \), is hung; when the weight is down, the bar must be fled along the axis, far enough to be lifted up clear of the teeth, and in to be puffed back into its place again, above the next tooth.

The machine at the Royal Arsenal at Woolwich is shown in fig. 17. The two supports of the gun, A B, are of solid brass, and well polished; the drill-bar, E, slides on a strong table, with the rock, I, at its end, the axis of the pinion, \( o \), is upright, and has a wheel, \( d \), at its top, working into an endless screw, \( c \), which has a wheel, \( f \), upon the end of the spindle, with handles on its circumference, for two men to turn it round by; on one of the spokes, \( g \), a common handle is fixed, to turn the wheel back, for withdrawing the drill-bar; the pinion, endless screw, and wheel, \( d \), are enclosed in a brass box, which supports their axes. We think this machine might be improved, by having the pinion horizontal, and applying a weight to it, as before described in the other machines.

Cannons are always cast with a large cap, or piece of spare metal, at the mouth; in the old guns, which were cast hollow, this piece was cut off by a law; in the solid guns, at the Grafton iron works, it is cut off by a machine, represented in fig. 20. On the lathe for turning the outside of the gun, a cast-iron frame, A A, is fixed, for supporting steadily the chisel, \( b \); between the end of the chisel and the frame, a wedge, \( d \), is put in, which a man continually drives with a hammer, to advance the chisel, and turn a notch in the gun; when it is cut about \( \frac{3}{4} \) inch deep, it is broken off by hammers. We think a screw would be judiciously substituted for the wedge.

After cannons are bored, and their outsides turned, the touch-holes are drilled by instruments, figs. 18 and 19; in fig. 18, A A A is a frame of wood, mounted on wheels, B, at one end, for convenience of moving when it is to be used; the frame is wheeled close to the gun, D, laid on two blocks of wood, F F, high enough to take the wheels off the ground, and prevent its running back; the drill, E, and its bow, G, are then to be fixed, between the place of the touch-hole of the gun and the block, H; which block is advanced by one arm, I, of a bent lever, by means of the weight, C, hung on the other arm, \( d \).

In fig. 19. A is a beam of the building, through which a screw, B, works; the lower end of this screw is hollow for some inches, to receive a small part, \( c \), of the drill, C; on the lower end of the drill a head wheel, \( F \), is fixed, to act as a fly; to the upper part, \( e \), of the drill, the ends of two strong catguts are fastened, and after being twinned round it a few times, the other ends are tied to a handle, F E, at \( e \) and \( f \). To use this machine, a gun is brought and laid under the beam, A, the drill set up with the point, \( e \), in the end of the screw, B, which must be screwed down till the point, \( e \), touches the bottom of the hole in the screw, to prevent the point of the drill from slipping away from the intended touch-hole; the workman must then wind up the cords, by turning the wheel, F; when the handle, E, is in the position of the figure, he must force it down quickly, which will turn the drill round; when the catguts are untwisted, he must let the handle rise, but still hold it, to prevent its turning round with the drill, which will continue to turn by the momentum of the wheel, \( V \), and wind the handle, E, to the fame length as in the figure, but with the cords in a contrary direction. The man must then force the handle down again as before.

Fig. 21. represents the different kinds of borers; A is the borer used for solid guns, and a a section of the same; B and C are different views of the borer for boring hollow guns the first time, and D and E are two different borers for finishing either kind of guns.

The following are the dimensions, both of the iron and brass guns, which the French use at present in their sea and land service, and have made use of ever since their revolution.
Table of the Dimensions of French iron cannon for sea service taken parallel to their axes.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Feet</th>
<th>Inches</th>
<th>Lines</th>
<th>Points</th>
<th>Fract.</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 Pounder</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>24 Pounder</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>18 Pounder</td>
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<td>0.00</td>
<td>0.00</td>
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<tr>
<td>12 Pounder</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>8 Pounder</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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</tr>
<tr>
<td>6 Pounder</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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</tbody>
</table>

Total length, length of the breech, and length of the calibers.
<table>
<thead>
<tr>
<th>Cannon</th>
<th>Fract.</th>
<th>Points</th>
<th>Lines</th>
<th>Inches</th>
<th>Feet</th>
</tr>
</thead>
<tbody>
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<td>4 Pounder</td>
<td>Fract.</td>
<td>Points</td>
<td>Lines</td>
<td>Inches</td>
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<td>Fract.</td>
<td>Points</td>
<td>Lines</td>
<td>Inches</td>
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<td>12 Pounder</td>
<td>Fract.</td>
<td>Points</td>
<td>Lines</td>
<td>Inches</td>
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<tr>
<td>18 Pounder</td>
<td>Fract.</td>
<td>Points</td>
<td>Lines</td>
<td>Inches</td>
<td>Feet</td>
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<tr>
<td>24 Pounder</td>
<td>Fract.</td>
<td>Points</td>
<td>Lines</td>
<td>Inches</td>
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<td>36 Pounder</td>
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<td>Points</td>
<td>Lines</td>
<td>Inches</td>
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<tr>
<td>Dimensions</td>
<td>Fract.</td>
<td>Points</td>
<td>Lines</td>
<td>Inches</td>
<td>Feet</td>
</tr>
</tbody>
</table>

Table of the dimensions of French iron cannon for the sea service taken perpendicular to their axes.

<table>
<thead>
<tr>
<th>Weight of the cannon</th>
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<tr>
<td>338 lb.</td>
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<tr>
<td>385 lb.</td>
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<tr>
<td>399 lb.</td>
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<tr>
<td>412 lb.</td>
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<tr>
<td>414 lb.</td>
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<tr>
<td>416 lb.</td>
<td>15.0</td>
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<tr>
<td>790 lb.</td>
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</table>
**Cannon.**

Table of the dimensions of the French braze cannon for land service taken parallel to their axes.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Besieging or battering cannon.</th>
<th>Garrison cannon.</th>
<th>Field cannon, 12, 8, and 4 pounders.</th>
<th>Cannon for light troops.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>16 Pounder.</td>
<td>12 Pounder.</td>
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<tr>
<td>c</td>
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<td>d</td>
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A Table of the dimensions of French brafs cannon for land service, taken perpendicular to their axes.

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<tr>
<th>Dimensions</th>
<th>Befling or battering cannon</th>
<th>Garrison cannon</th>
<th>Field cannon, 12, 8, and 4 Pounders</th>
<th>Cannon for light troops</th>
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Weight of Cannon and Maffelotte

| 5628 lb. | 4111 lb. | 3184 lb. | 2175 lb. | 1808 lb. | 1186 lb. | 590 lb. | 266 lb. |
| 3100 lb. | 2600 lb. | 1800 lb. | 1200 lb. | 1235 lb. | 950 lb.  | 550 lb. | 250 lb. |
Canon a l’Espagnol, or a Spanish cannon, is one, that has a chamber at the bottom of the bore in the form of a sphere or a little flattened.

Canon a la Svedés, or a Swedish cannon, is a piece, that carries a four pound ball, and weighs about 600 lbs.

Canon de Campagne ou de bataille, field or battle-cannon, are pieces that are employed in the field with armies.

The composition and proportions of the ingredients made use of in casting bra's cannon, are nearly the same in the different nations in Europe. Founders have affected to keep this composition a secret: it is, however, well known: and if it were not, it would be a secret not worth keeping. For none of them have been able to find out a composition for such guns, as will enable them to stand quick and continued firing, or a hot engagement, without either melting or becoming useless. They are not so well calculated for severe and hard services as good iron guns, that are both lighter and more transportable.

The common proportion of the copper to the tin in gun-metal, is that of 10 to 12. Some founders put to 240 lbs. of metal for casting 68 lbs. of copper, 52 lbs. of bra's, and 12 lbs. of tin. The Germans put to 400 lbs. of metal for casting, 367 4/12 lbs. of copper, 204 4/12 lbs. of bra's, and 97 7/12 lbs. of tin. Some use 150 lbs. of copper, 6 lbs. of bra's, and 5 lbs. of tin; and others 100 lbs. of copper, 10 lbs. of bra's, and 15 lbs. of tin. In short, different founders are guided in their proportions of these materials, by their own whims and fancies. See Copper.

The French make use of mortars, that have their calibers, or the diameters of their bores, each equal to eight inches, three lines of their measure. These mortars have cylindric chambers, each of which contains 1 4/9 lbs of powder. Such a mortar weighs 550 lbs.

They have also mortars of twelve inches diameter with cylindric chambers, each of which contains five pounds and a half of powder. Such a mortar weighs 1450 lbs.

They have likewise mortars of twelve inches caliber, or diameters with chambers a poire, or pear chambers; each of which holds, in like manner, five pounds and a half of powder. Such a mortar weighs 1700 lbs.

They use also mortars of twelve inches caliber, or diameter with pear chambers, each of which holds twelve pounds of powder. Such a mortar weighs 2250 lbs.

Besides these, they have mortars of ten inches diameter, and some of eighteen inches diameter or caliber.

They likewise use these mortars, or mortars for throwing stones of fifteen inches diameter, with chambers in the form of truncated cones, each of which holds two pounds and a half of powder. Such a mortar weighs 1000 lbs.

Cannon, ships, are stronger in metal than those used by land, on account of the necessity they are often under of being charged with chain-shot. They lie on ship-carriages, having four small wheels, without spokes, with two ropes to flop their running back, and bring them again to their place upon the battery.

Cannon of coufè, or Clear-Cannon, in a galley, is the largest, middlemost, and most effective of the guns placed in the prow, or chase of the vessel, and which delivers its shot over the very item, generally carrying a shot of 33 or 34 pounds weight. It is a long piece, and recoils all along the middle of the galley to the main.

Cannon-mouth of a bit, in the Range, denotes a round, long piece of iron, sometimes composed of two pieces coupled together and bent in the middle. Cannon-months are contrived to keep a horn in subjection, being so ordered that they rise gradually toward the middle and ascend toward the palate, that the void space left underneath may afford a liberty to the tongue. See Bit.

Cannonade. To cannonade any object either by sea or land is to discharge or fire cannon at it. A cannonade may take place between fleets, shipping, armies, &c. It may be made by ships against ships, towns, works, batteries; or by batteries works, towns, against ships, &c. A cannonade may take place between two armies, either occupying field positions, or drawn up in order of battle for the purpose of engaging. An army standing on the defensive may keep up a heavy cannonade on the enemy advancing to attack them. The besiegers may cannonade the works of the beleaguered, and the beleaguered may cannonade the approaches and batteries thrown up by the besiegers.

Cannonier, or Cannonier, a peron who is employed in the management, or in the working and firing of cannon. It is a term sometimes made use of to denote an artillery-man, a gunner, and sometimes an artillery officer. Thus, maître canonnier signifies an officer of artillery, whose duty is to attend to the pointing, loading, and firing of the cannon in his charge.

Cannula, in Surgery, is a hollow instrument, usuall, cylindrical, and made of metal; employed for the transmigration of any fluid out of the body, or for the conveyance of some remedial application to an interior organ. For example, the ancients referred to such an instrument, to defend the adjacent parts, on several occasions, when they applied a hot iron so as to act as a canter, (See Cauter.) and the moderns employ a cannula to draw off pus or dropical accumulation from within a large cavity, (See Dropsey, and Trocar): but the use of a cannula for keeping open deep wounds is very problematical; or rather, it is now generally rejected, as being hurtful in many cases, and needless in all.

Cannula, or Canola, in Ecclesiastical Writers, was a tube of silver, or other metal, wherein were put the relics, which the pope sent as presents to princes, &c.

Canuula, or Canola, was also a sort of fibon, through which they anciently sucked the wine in the eucharist.

Canay, Alonso, in Biography, called the Michael Angelo of Spain, from his excelling in the three arts of painting, sculpture, and architecture, born in 1660 at the city of Grenada. Having studied the principles of architecture under his father, an eminent architect of his native city, he directed his attention to sculpture, as a disciple of Pacheco de Sevilla, and he afterwards applied himself to the art of painting in the academy of Juan de Casillo the painter, in the same city. Besides many fine pieces which he executed for the public edifices of Sevilla, he also practiced sculpture, and made two cyllindrical figures of St. Peter and St. Paul of such peculiar excellence, that the Flemish artists are said to have visited Sevilla in order to have an opportunity of copying them. Claiming noble birth, and possesing a high spirit, his first productions were gratuitous. In consequence of a quarrel with Sebastian de Llanos, an eminent painter, which terminated in a duel, he was obliged to quit Sevilla; and in the suite of the count-duke Olivares, as well as under his protection, he went to Madrid, where he was soon appointed first royal architect, king's painter, and instructor to the prince, Don Balthazar Carles. In this situation he acquired distinguished reputation as an architect, sculptor, and painter. His fame, however, excited jealousy and envy, and he was charged with plagiarism in the composition of his pieces. But another circumstance occurred, which was much more injurious to his prosperity. Upon his returning home one evening, he found his wife murdered and his house pillaged, and
and an Italian journeyman mending. The magistrates, discovering that Cano had been jealous of this Italian, and that he was attached to another woman, charged him with the murder; and he was reduced to the necessity of making a speedy escape. He fled for refuge to Valencia, but was soon betrayed by the practice of his art; and he then sought an asylum in a Carthusian convent near that city; and being deterred from taking the order by the dread of its severities, he returned to Madrid, where he was apprehended and delivered to the torture in order to extort a confession. Having endured the rack without cermiration, he was again taken into favour by the king; and with a view to his future security, he obtained the clerical office of refectori of Grenada. In this situation he enriched the churches of Grenada and Malaga with many paintings and sculptures. But having been refused the payment of two pilloles by a counsellor of Grenada for an image of St. Anthony of Padua, he deftied the faint in pieces on the floor of his academy. This fall of passion induced the chapter of Grenada to suspend him from his function; but he was restored by the king, on the condition of finishing a magnificent crucifix, which the king had bespoke, but which he had long neglected. From this time he led a life of charity and devotion; and when delitute of money, he supplied the wants of a beggar by sketching a drawing upon paper, and directing him how to dispose of it. The violence of his temper was still un subdued; and even in his last moments he could not be prevailed upon to make use of a crucifix which was presented to him for adoration, because it was such a wretched piece of work, that he could not bear the sight of it. Cano died at the age of 75, in the year 1676. Cumberland’s Annals of Eminent Painters in Spain. Gen. Biog.  

Cano, or Canus, John Sebastian del, a native of Biffay, who accompanied Magellan in his voyage through the straits, bearing his name, and who, after his death, took the command and proceeded to the isles of Sunda. Thence doubling the cape of Good Hope, he arrived at Seville in 1522, having performed the voyage round the world in three years and four months. Charles V. gave him for a device a terrestrial globe, with this legend, “Primus me circumdedisti.” i.e. thou first hast surrounded me. Moreri. Gen. Biog.  

Cano, or Canues, Melchior, a Spanish theologian, was a native of Tarazon in the diocese of Toledo. Having studied at Salamanca under Francis Victoria, and entered into the order of St. Dominic, he succeeded his predecessor in the theological chair in 1546. Between Cano and Bartholomew Caranza, archbishop of Toledo, who was also at the same time professor at Salamanca, there subsisted a jealousy, which produced two parties in the university. But Cano was superior to his rival in the powers of his genius and the extent of his learning, as well as in the vivacity of his temper and the readiness of his eloquence. Paul III. deputed him to attend the council of Trent; and in 1552 he was made bishop of the Canary islands. He was distinguished, by the favour of king Philip II. and of his unfortunate son, Don Carlos, and it is laid that he sacrificed the interest of the latter to that of the former. He was also charged with having attempted to pervert the king that he might lawfully make war against any foreign, in the assertion of his own rights; but in advancing this principle, he offended the court of Rome. Such were his ambitious views, that he resigned his bishopric in order to be near the court; but he could not long indulge them, as he died at Toledo in 1560, soon after he was appointed provincial of Castile. His work entitled “Locorum Theologicorum lib. xii.” in which he explains the principles or sources (for that is the sense in which he uses the term loci) whence arguments may be deduced for the confirmation of doctrines and opinions, is highly commended by Du Pin. Whilst he maintains the authority of the church of Rome, and the infallibility of the pope, he introduces many liberal sentiments, and it appears that he gave little credit to the legends and fables of corrupt ages. We have some bold and generous remarks to this purpose, cited by Dr. Jortin, in his Remarks on Ecclesiastical History, vol. ii. p. 316-319. Cano’s Latin style is good. Besides the work already mentioned, he also wrote “On the Sacraments,” and “Six Lectures concerning Penance.” Du Pin. Moreri.  

Cano, or Canus, in Geography. See Ghana.  

Cano, a river of Finland, which falls by Birnborgh.  

Canoa, a town of Japan, in the province of Iwami.  

Canobio, a town of Italy, in the Milanese, on the west side of the lake Maggiori; 13 miles S.E. of Dom. d’Ofcello. N. Lat. 45° 58’. E. long. 8° 47’.  

Canoes Island, an island so called by Mr. Mackenzie in his voyage through the N.W. continent of America; situated in about N. Lat. 53° 31’. W. long. 122° 45’.  

Canoes-ridge, a rugged mountain of America, about 200 miles W. of Philadelphia, forming the eastern boundary of Bald Eagle valley.  

Canoes, in Sea Language, a small vessel used by various inhabitants of the earth for the purpose of fishing, of trading, and travelling along rivers, and of war. Canoes are made of different materials, such as the trunk of a tree, the bark of trees, skins of animals, &c. Canoes used on the American, or other rivers, in confluence of the curved form of their transverse fection, carry their lading higher than square-sectioned boats of similar width; and are therefore capable of conveying large hogheads of tobacco, or of other articles, with safety.  

Canoes of the aborigines of Canada, is made of the bark of the birch; and some are of a size sufficient to contain four or five persons.  

Canoes of the Esquimaux, is made of whalebone, about an inch square; there are not felt like ribs, but are from items to items felt fast to each other with strong sinews, and covered over with sealskins. They are from ten to twenty feet long, and about two feet broad; they are formed like a weaver’s shuttle, sharp at both ends, so that they can be rowed either way. In the middle of the canoe are the ribs, both to keep the sides afloat, and to form the hole in the covering wherein the rower sits. A flat hoop is fitted to this hole, rising about four inches, to which the surrounding skin is sewed. The Indian’s seal-skin jacket, being of a proper length, he can occasionally bend the skirt of it round the outside of this hoop; by which means, he keeps the canoe free from water, and is enabled to procure his game far from the land, or in stormy seas. His paddle is from 20 to 30 feet long, being light, and flat at each end: this serves him to balance and steer his canoe, but particularly to row it, which he does with that incredible celerity, that an English boat with ten oars is not able to keep company with the canoe. The young men in their excursis are taught to over-crest their canoes, and when the bottom is upward, to recover by the dextrous management of their paddle, their former upright position, the men rising again either on the side by which they went down, or on the contrary, as they please. The construction of this extraordinary little vessel, so admirably well adapted to the purposes of its owner, does the greatest credit to the ingenuity of the constructor. There is a canoe of this description in the repository of the Royal Society, and another in the library of the marischal college, Aberdeen.  

Canoes of Davis Straits, is in the form of a barge, seven
or eight feet long, and two in breadth; the materials made use of are plant, bent and interlaced like a hurdle, and covered with the skins of sea dogs, or wolves. This light boat carries only one man, who, seated in a hole formed in the middle of what, from this circumstance, appears to be a deck, is enabled to fill, or to transport himself with facility, and without much apparent danger, from one coast to another.

**Canoe of the coast of Guinnea.** It is made by hollowing the trunk of a tree; it is of a long figure, and swins with only a small part of its body above the surface of the water; so that the person who sits behind, and guides the canoe, is frequently half covered with water. The breadth is no more than sufficient to contain one man, and the length for seven or eight. The men are fented on round pieces of wood, and half their bodies are below the gunwale. Each man has an oar of a very hard wood, and all row together, like galley-men, in one concordant motion; or, if an individual pulls too strongly, putting the canoe out of its line, his mistake is so well counteracted by the man that guides in the stern, that the whole seems to fly along the surface of the water, and cannot be run long followed by any European vessel. When, on the other hand, the sea is high, they are unable to steer, the lophines of the waves preventing their answering the helm. When the surf overthrows them, they have the address to turn their canoe in the water, to empty it, and re-embark, without running the smallest danger, swimming all the time like fish. These canoes are generally about sixteen feet long, and one or two broad: there are, however, some much larger, measuring thirty five feet in length, five in breadth, and three in depth; they are flat at the stern, with a rudder and deck; the sails are made of reeds, or of grass. The canoes are not allowed to remain in the water, but are drawn on shore, and placed on four treffles; when dry, two men can carry a canoe on their shoulders. In shaping and hollowing the trunks they have felled, the negroes now make use of the hatchets that are sold to them by the Europeans. They narrow them towards the bottom, and cut each end to a point, giving it a small bend of about a foot long, and of a thicknes adapted to the hand, for the purpose of lifting the canoe.

**Canoe of the Indian and Charibbes.** It is the simple trunk of a tree, hewn on the outside to the defird form, and hollowed within by means of fire. Its size consequently depends upon that of the tree of which it is made. It is rowed with paddles and oars, and sometimes has the affifance of a little sail. The lading is placed at the bottom, but as the canoe is not ballasted, it frequently overfets. The aftermost oars supply the purpofe of a rudder.

**Canoe of Noetka Sound.** The large war canoe is generally finished on the spot where the tree grows of which it is made, and then dragged to the water's side. Some of them have been seen which were fifty three feet in length, and eight feet in breadth. The middle part of these canoes is the broadest, and gradually narrows to a point at each end; but their head or prow is generally much higher than the stern. As their bottoms are rounded, and their sides flan out, they have consequently sufficient bearing, and a considerable degree of flability. They have no fets, but several pieces of wood, about three inches in diameter, are fixed across them to keep their fides firm, and preferf them from being warped. The rowers generally fit on their hams, but sometimes they make use of a kind of small fool, which is a great relief to them. In the art of embarking they are extremely cautious, each man regularly taking the flation to which he has been accustomed. Some of these canoes are polished and painted, or curiously flumbed with human teeth, particularly on the ftern and prow. This is affirmed on the authority of captain Cook, who says that the people of the sea coast adorned their canoes with human teeth. But Mr. Mackenzie (Journal of a Voyage through the N. W. Continent of America, p. 335.) informs us, that he was particular in his inquiries, and that he obtained the most satisfactory proof that captain Cook was mistaken; and that his mistake arose from the great fleremance there is between human teeth and those of the sea otter, with which the gunwale, fore and aft, of a canoe, which he examined, was lined. The fides were sometimes adorned with the figure of a dragon with a long tail, of much the fame form as is seen on the porcelain of China, and in the fanciful paintings of other countries.

**Canoe of Kaffir.** Employed on the lake of Wolda, is rounded at both ends; it is much wider in the middle than at either end, and is worked with a single oar, which is placed at the stern: but all the other canoes of that country terminating sharply both ways, are elevated before as well as behind. They are hardened by means of fire, protected from the weather by paint, and lashed round for the purpofe of giving them additional strength.

**Canoe of Terra del Fuego and the Straight of Magellan.** Is of a peculiar construction. The natives take the bark of the largest trees, and bend it into a shape with so much skill, that the vessels have a resemblance to the gondolas of Venice. For this purpofe they place it on a small piece of wood, as Europeans place a flip on the flocks; and when the bark has taken the gondola form, and the necessity bend, they line the bottom and fides, from one end to the other, with upright pieces of their wood, in the fame manner as the parts or frames of a flip are put together: round the top of the deck another bandage of bark is drawn, in doing which, the utmost care is taken to fen the whole together. These canoes are from ten to sixteen feet in length, and two in breadth; holding with sufficient convenience, seven or eight men, who row fanding, and with extreme celerity. See also the articles BOAT, PROA, &c.

**Canoge, or Canouge, in Geography, a town of Hindoofn, feated on the right bank of the Ganges, near the place where the Calini or Callynuddi river joins its. Its ruins are even now of great extent, and in an early part of the Christian era, it was the capital of Hindoofn, or rather of the principal kingdom along the Ganges, and is possibly the place meant by Phiy for Calinippa. It is at present reduced to the fize of a middling town. It is faid to have been built more than 1000 years before our era; and is mentioned in Tertiffa (320 years B. C.) as the capital of all Hindoofn, under the prece fend of Phoos, or Perus, who fought against Alexander. Canogoe corresponds, with regard to extent and magnificence, to the defcription given of Palibothru, and in some refpects, to the local position alligned to it by Ptolemy and Eratofhenes; but other authorities allign this place to Patna. The Indian histories abound with the accounts of its grandeur, and populousnes. Its walls are faid to have been 300 miles in circumference, and its third emperor, Sinalk, could bring into the field 400 elephants, 100,000 horse, and 400,000 foot. In the fifth century it was found to contain 50,000 shops, in which betel nut was sold, 3000 jewellers, and 60,000 bands of musicians, who paid a tax to government. In the year 1018 it was feized by the Gazan emperors, at which time it gave its name to the kingdom, of which it was the capital. It is distant from Agra 127 miles; from Benares 259; from Bombay 889; from Calcutta by Mauritbad 824, by Birbom 719; from Delhi 234; from Lucknow 75; from Madras 1141; from Nagpoure 486; from Ougne 464; and from Poonah 842. N. lat. 27° 3'. E. long. 80° 13'.

**Canon,**
CANON.

CANON, in Ecclesiastical History, a person who possesses a prebend or revenue allotted for the performance of divine services, in a cathedral, or collegiate church.

Canons are of no great antiquity: Paschier observes, that the name canon was not known before Charlemagne; at least the first we hear of are in Gregory de Tours, who mentions a college of canons, instituted by Baldwin XVI, archbishop of that city, in the time of Clotharius I. The common opinion attributes the institution of this order to Chrodegangus, bishop of Metz, about the middle of the eighth century.

Originally canons were only priests, or inferior ecclesiastics, who lived in community; residing by the cathedral church to fulfill the bishop; depending entirely on his will; supported by the revenues of the bishopric; and living in the same house, as his domestics, or councilors, &c. They even inherited his moveables till the year 817, when this was prohibited by the council of Aix-la-Chapelle, and a new rule substituted in the place of that which had been appointed by Chrodegangus, and which was observed for the most part, in the west till the twelfth century. By degrees these communities of priests, flaking off their dependence, formed separate bodies; whereof the bishops, however, were still heads. In the tenth century there were communities, or congregations of the same kind, established even in cities where there were no bishops; these were called collegiates, and as they used the terms congregation and college indifferently: the name chapter, now given to these bodies, being much more modern. Under the second race of the French kings, the canonical, or collegiate life, had spread itself all over the country; and each cathedral had its chapter, distinct from the rest of the clergy.

They had the same canon from the Greek νόμος, which signifies three different things: a rule, a pension, or fixed revenue to live on, and a catalogue or matricula; all which are applicable to them.

In time, the canons freed themselves from their rules, the observance relaxed, and at length they ceased to live in community; yet they still formed bodies; pretending no other functions besides the celebration of the common office in the church; yet assuming the rights of the rest of the clergy; making themselves as a necessary council of the bishop; taking upon them the administration of a fee during a vacancy, and the election of a bishop to supply it. There are even some chapters exempt from the jurisdiction of the bishop, and owning no head but their dean. After the example of cathedral chapters, collegiate ones also continued to form bodies, after they had abandoned living in community.

Canons are of various kinds; as,

Canons, cardinal, or those attached, and as the Latins call it, incolariato a church, as a priest is to a parish.

Canons, domesticus, were young canons, who not being in orders, had no right in any particular chapter.

Canons, exemptus, were such as, without having any revenue or prebend, had the title and dignities of canons, a voice in the chapter, and a place in the choir, till such time as a prebend should fall.

Canons, foreignus, were such as did not officiate in the canons to which they belonged. To these were opposed manumori canones, or canones relictuarie.

Canons, lay or honorary, are such among the laity, as have been admitted, out of honour and respect, into some chapter of canons.

Canons, regular, are canons that dwell in community; and who, like religious, have, in process of time, to the practice of their rules, added the solemn profession of vows. They are called regularis, to distinguish them from those secular canons who abandon living in community; and at the same time, the observance of the canons made as the rule of the clergy, for the maintenance of the ancient discipline.

The canons fulfilled in their simplicity till the eleventh century, some lay the twelfth century, when some of them, departing from the community, took with them the name of canons, or aephephalous priests, because they declined to live in community with the bishop; and those who were left, then adopted the denomination of canons regular, and adapted most of the professions of the rule of St. Augustine. This order of regular canons of St. Augustine was brought into England by Adelwald, confessor to Henry I, who erected a priory at St Albans, in Yorkshire, and obtained for them the church of Carlisle as exempted, with the privilege of chusing their own bishop. They were originally protected and encouraged by Henry I, who gave them the priory of Dunstable in 1135, and by queen Matilda, who in the following year, gave them the priory of the Holy Trinity in London. It appears, that under the reign of Edward I., they had fifty-three priories.

Canons, tertiaries, those who had only the third part of the revenues of the canonicate.

Canon, in an Ecclesiastical Sense, is a law or rule, either of doctrine or discipline, enacted especially by a council, and confirmed by the authority of the sovereign.

Canons are properly decisions of matters of religion; or regulations of the polity and discipline of a church, made by councils either general, national, or provincial. See Council.

Such are the canons of the council of Nice, or Trent, &c.

See Constitutions.

There have been various collections of the canons of the Eastern councils; but four principal ones, each smaller than the preceding. The first, according to Ufner, A. D. 380, containing only those of the first ecumenical council, and the first provincial ones: they were but 164 in number. To these, Dionysius Exiguus, in the year 520, added the fifty canons of the apostles, and those of the other general councils. The Greek canons in this second collection, end with those of the council of Chaledon; to which are subjoined those of the council of Sardica, and the African councils. The fourth and last collection comes down as low as the second council of Nice; and it is on this that Balsamon and Zonaras have commented. See Hardouin's Acta Conciliorum et Epistolarum decoctals ac Constitutiones Summarum Pontificum, in 11 tomes; commencing with the year 34, and terminating in 1714. ProL Paris, 1715.

Canons, Apollonius, are those which have been usually ascribed to St. Clement, in order to procure for them a high degree of authority. They contain a view of the church government and discipline received among the Greek and oriental Christians in the second and third centuries. Bellarmin, Baronius, &c. will have them to be genuine canons of the apostles. Cotelerius observes, (Jud. de. Canon. Ap. ap. Patr. Ap. 1.) that they cannot be ascribed to the apostles or Clement, because they are not received with other books of Scripture, are not quoted by the writers of the fifth ages, and contain many things not answerable to the apocryphal times. Hincmar, De Marco, Beveridge, &c. take them to be framed by the bishops who were the disciples of the apostles in the end of the second and beginning of the third centuries. Beveridge (Cod. Can. Vindicat. I. c. x. 4.) acknowledges that they are interpolated in several places, though he professes a great veneration for them, and has undertaken to defend them. The bishop ascribes a kind of apolitical authority to the 50th canon, which requires of the bishops and prebendaries that they should make use of a three-fold immersion in baptism, under pain of being deposed. The 55th canon strict-
IV. requires the observation of the quadragesimal fast, under spiritual pangs and penalties; and this, together with other <br>stated fasts, Beveridge supposes to have been apocalyptic <br>imitation. S. Bafnage is of opinion, that they were col-<br>lected by an anonymous writer in the fifth century; but <br>Daille, &c. maintain them to have been forged by some <br>heretic in the sixth century; and S. Bafnage conjectures, <br>that some of them are ancient, and others not older than the <br>seventh century. The 8th canon contains a catalogue of <br>the books of the Old and New Testament; which, from the <br>books of the New Testament, that are enumerated in it, could <br>not have been drawn up till after the third century. The <br>epistle to the Hebrews was rejected, or doubted of by many <br>in the first three centuries, and also in the fourth century; <br>but if this canon had been then in being, and acknowledged <br>as apocalyptic, that epistle would have been received by all. <br>Several of the catholic epistles, that of James, the second <br>of Peter, the second and third of John, and that of Jude, were <br>rejected, or doubted of by many in the early times of Chris-<br>tianity; whereas they would have been received by all, if this <br>canon had been in being, or had been acknowledged to be <br>apocalyptic. This argument is urged by Mill, in his "Pro-<br>logomena," p. 201. Moreover, the Revelation was received <br>by many in the second, and third, and following centuries, <br>which would not have been the case, if there had been a <br>canon composed by the apostles, or Clement their companion, <br>in which all other books of Scripture were distinctly enumer-<br>ated, and that omitted. How, says Baronius to this pur-<br>puse, could so many of the Latin and Greek writers receive the <br>Revelation, which was wanting in an apocalyptic canon? <br>And how could there have been such different opinions about <br>the epistle to the Hebrews, and several of the catholic epis-<br>tles, if they had been made canonical by an apocalyptic de-<br>cree? Besides, the first epistle of Clement was reckoned ca-<br>nonical by very few, if any of the writers of the first three <br>centuries; therefore this pretended apocalyptic canon, which <br>gives it a place among books of sacred Scripture, was not in <br>being; and the second epistle of Clement was not esteemed <br>his in the third century, though the catalogue of this canon <br>includes it. The Greek church allows only 8 of these ca-<br> nons, and the Latins only 50; though there are 84 in the <br>edition given of them in the "Corpus Juris canonici." See <br>Lardner's works, vol. iv. p. 334, and Jortin's Rem. on <br>Eccles. Hist. vol. i. p. 278. &c. Cave, Hist. Lit. vol. i. p. 29. <br>Jones's New and Full Method of settling the Canonical <br>Authority of the New Testament, vol. i. p. 25.<br>Cannon, is also used for the authorized catalogue of the <br>sacred writings. The word is originally Greek, κανον, and <br>signifies a rule or standard, by which other things are to be <br>examined and judged. Accordingly the fame word has been <br>applied to the "tongue of a balance," or that small part, <br>which, by its perpendicularly position, determines the even <br>poize or weight, or, by its inclination either way, the uneven <br>poize of the things which are weighed. To this purpofe is <br>the observation of the ancient school of Aristophanes in <br>Ran. v. 809. Hence it appears, that as the writings of the <br>prophets, apostles, and evangelists contain an authentic ac-<br<count of the revealed will of God, they are the rule of <br>the belief, and practice of those who receive them.<br>Cannon seems also sometimes to be equivalent to a list or ca-<br>logue, in which are inserted those books, that contain the rule <br>of faith. Hence Du Pin, and others, have supped, that thefe <br>books are called canonical, because they are placed in the ca-<br>logue of sacred books. It has been said, however, that the <br>Greek word is never used in this sense, by any prophane writers, <br>nor even among the Chriftians, till the fourth century; be-<br>fore which time the word was certainly applied to the sacred <br>volume. Mr. Whilton (Essay on the Apoftical Conflit, <br>chap. i. § 6.) imagines the canon of Scripture, or the ca-<br>nonical books of the Old and New Testament, to be thefe, <br>and only thefe, which are inserted in the fifth apolo-<br>tical canon, and that they were fo fixed by the ancients only <br>on that account. But as the spuriousness of these pretended <br>apocalyptic canons is very generally allowed, it is needless <br>to refute this opinion. See Apoftical Canons.<br>The use of this appellation, as applicable to the books of <br>Scripture, is undoubtedly very ancient. St. Paul has twice <br>ufed the word canon, or rule. Gal. vi. 16. Philip, iii. 16. And <br>though in these passages he may refer to the doctrine of <br>the gospel in general, or to some particular maxim of it, and not <br>to any books containing the rule of faith, yet his use of the <br>word may have given occasion for fixing that denomination <br>to the books of Scripture. Irenæus, speaking of the Scrip-<br>tures, (Adv. Hæres. i. iv. c. 69.) tells them τοῦ κανόνος τῆς <br>αποστολῆς, i.e. the canon of truth; and here canon is not a <br>catalogue, but the books, or the doctrine contained in the <br>books of Scripture. Clement of Alexandria, (Strom. l. 4. <br>p. 453.) disputing with some heretics of his time, blames <br>them for making use of apocryphal Scriptures, "cheating <br>to follow any thing, rather than the true evangelical <br>canon (or the canon of the gospel)." In another place <br>(Strom. l. vi. p. 676.) he says, "the ecclesiatical canon is <br>the consent and agreement of the law and the prophets with <br>the Testament delivered by the Lord." Eclelus (Hist. <br>Ecclef. l. vi. c. 25.) tells us, that Origen, in his exposition <br>on Matthew, enumerates the books of Scripture according <br>to the canon of the church; i.e. the canon received and es-<br>tablished in the church. Athanasius, in his Enclial epistle, <br>mentions three forts of books, the canonical, which are those <br>now received by us, such as were allowed to be read, and <br>such as are apocryphal, by which he means books forged <br>by heretics. In the Synopsis of Scripture, which some have <br>ascribed to him, but probably not written till 100 years after <br>his time, near the end of the fifth century, there occurs fre-<brquent mention of canonical and uncanonical books. The <br>council of Laodicea, about 325, ordains, that "no books, <br>not canonical, should be read in the church, but only the ca-<br>nonical books of the Old and New Testament." The third <br>council of Carthage, about 397, ordains, "that nothing be-<br>side the canonical Scriptures be read in the church under <br>the name of Divine Scriptures," Epiphanius, Philastrius, Ruf-<br>inus, Jerome, Augustine, Chrysostom, Ildoare of Pelopon, and <br>Leontius of Cappadocia, use the words canon and ca-<br>nonical in the same fene. Hence we may infer, how much <br>the use of these words, canon and canonical, has obtained <br>among Chriftians, to denote those books, which are of the <br>highest authority, and the rule of faith; as opposed to all <br>others whatever, particularly to ecclesiatical, or the writings <br>of orthodox and learned catholicks, and to apocryphal, the <br>productions, chiefly of heretics, which by a fpecious name <br>and title made a pretention to be accounted among sacred <br>books. The mosf common and general division of the ca-<br>nonical books is that of ancient and new, or the Old and <br>New Testament.<br>The canon of the Old Testament is much more easily set-<br>tled than that of the New; because whatever almost may be <br>objeéted against the authority of the preface canon of the <br>former, either in behalf of any books which are not in it, or <br>againif any that are, may be anwered by this fingle confi-<br>deration, viz. that we receive the fame and no other books <br>than fuch as were received by the Jewish church in the time <br>of our Saviour, as is evident from the copies of them proc-<br>ured by the Chriftians, and the catalogues they made of <br>them soon after the deftruction of Jerusalem. Some differ-<br>ence,
C A N O N.

ence, however, has occurred in the mode of their arrangement. Holy Bay (de Bih. Text. Orig. x. c. vi. p. 192.), the notation of the sacred books into the Law, the Prophets, and Hagiography, is of the highest antiquity. The Jews are said by some, but as others think, without sufficient evidence, to have ascribed it to the prophet Ezra. Although the Jewish people have been very uniform in the number of sacred books received by them, they have varied, and have been somewhat arbitrary, in the general denominations and divisions of them. Haean Volfinus suspects that the above mentioned division, was an invention of Aquila, who, in the second century, made a new version of the Jewish scriptures into Greek; whereas, the old partition was that of the Law, the Prophecies, and Psalms. Dr. Lardner offers, that no traces of it appear in the Scriptures of the Old or New Testament, nor in Josephus, nor in Philo, nor in any Christian writers before Epiphanius and Jerom, near the end of the fourth century. Some, indeed, have supposed that this tripartite division is referred to in Luke, xxiv. 42; but other learned and judicious persons, as Le_escen and Wollins, are of opinion that by the "Psalms," in this place we are not to understand the metrical books, or any other general division of the scriptures of the Old Testament, but the book of Psalms. J. F. Buddens. (Hist. Eccl. Vet. Test. tom. posterior, p. 818, 310. Halle Magdeburg. 1719.) cited by Lardner, says it is uncertain when and by whom this partition was first used; and he also shews the impropriety and inconvenience of it, as generally used by the Jews. It does not appear that any notice is taken of it, or regard had to it in Melito, Origen, Cyril, or Athanasius. Among those who have used this partition, there seems to have been a great variety of opinions concerning the books that should be called "Hagiographa." The term has nothing in it appropriate and distinctive; and this may have been the ground of that difference of opinion among those who have used it, concerning the books that should be placed in this class. Every other partition of the sacred books of the Old Testament, with which we are acquainted, seems, in the judgment of Dr. Lardner, to be preferable to this of the Law, Prophets, and Hagiography. Those denominations, which we sometimes meet with in the New Testament, the "Law," or "the Prophets," denoting in general the ancient sacred writings, are very just. The dichotomy, "the Law and the Prophets," to common in the New Testament, is very proper. The tripartite division in Luke, xxiv. and Josephus, "the Law, the Prophets, and Psalms or Hymns," is also very proper. Another partition is that used by Cyril of Jerusalem, viz. legal, historical, metrical, and prophetic, which seems to have been regarded by Athanasius, Origen, and Melito, in their catalogues, appears to Lardner and others the most proper and commodious.

Some have placed the books of the Old Testament from the first to the last, in chronological order. This, however, is a matter of no importance, and might be found inconvenient. But if they are divided into classes, the order of time may be useful. Accordingly, in the first class, must be the five books of Moses; then the historical books, Joshua, Judges with Ruth, Samuel, the Kings, the Chronicles, Ezra, Nehemiah, Esther; next the metrical books, Job, the Psalms, the Proverbs, Ecclesiastes, the Canticles; lastly, the prophetic books, the twelve prophets in one book, each of which might be placed, according to the order of time, Isaiah, Jeremiah, with the Lamentations, Ezekiel, Daniel; or, first of all, the four larger prophets, and then the book of the twelve letter prophets, as they are called: by which we perceive, that the present order of books in our Bibles is, in the main, such as we have reason to be well satisfied with.

The first catalogue of the books of the Old Testament recorded by any Christian writer is that of Melito, Bishop of Sardis, in Lydia, who is placed by Cæsarius of the year 416. He travelled into Palestine on purpose to learn the contents of these books. Epiphanius has preserved his catalogue, and he says, that it is a catalogue of the scriptures of the Old Testament universally acknowledged. It contains the books received by the Jews into their canons; but he does not mention the book of Esther. The order in which he enumerates them is as follows, viz., five books of Moses, Joshua, Judges, Ruth, four books of the Kings, two books of Chronicles, the Psalms of David, the Proverbs of Solomon, the Ecclesiastes, the Canticles, Job, the books of the Prophets, Isaiah, Jeremiah, the Twelve Prophets in one book, Daniel, Ezekiel, Ezra, Origen, about 220, has a catalogue, in which the books occur in the following order, viz., five books of Moses, Joshua, Judges with Ruth, one book; the first and second book of the Kings, called by them Samuel, and reckoned one book; the third and fourth of the Kings, also one book; the first and second of the Remains, in one book; Esdras, first and second, in one book, called by them Ezra; the book of the Psalms; Solomon's Proverbs, Ecclesiastes, Canticles, Isaiah, Jeremiah, Daniel, Ezekiel, Job, Esther. The book of the Twelve Prophets is wanting in our copies. Athanasius, in his Pedale Epistle, and also in the Synopsis, enumerated the books in this order, viz., the five books of Moses; then the historical books, from Joshua to Ezra; then, the books in verse, the Psalms, Proverbs, Ecclesiastes, Canticles, Job; lastly, the Prophets, which are the Twelve Prophets in one book, Isaiah, Jeremiah, Ezekiel, and Daniel. Cyril of Jerusalem, about 354, has a catalogue, in which he utters divisions. The first are the five books of Moses; then the historical books; after them, five books in verse, Job, the Psalms, the Proverbs, Ecclesiastes, the Canticles; and, last of all, five prophetic books, which are the Twelve Prophets, in one book, Isaiah, Jeremiah, Ezekiel, Daniel. Epiphanius, about 368, has three catalogues; in two of which all the books of the Old Testament are enumerated from Genesis to Ezra or Ether, without any partitions. But in the other he divides them, observing, that the books of scripture are comprised in four Pentateuchs, and two over and above the first Pentateuch, or that which is most properly so, containing the five books of the Law: the next contains the five books in verse, the book of Job, the Psalter, the Proverbs of Solomon, the Ecclesiastes, the Canticles; the third Pentateuch contains those called Graphica, by others Hagiographa, which are the book of Joshua, the book of Judges with Ruth, the first and second of the Remains, the first and second of the Kingdoms, and the third and fourth of the Kingdoms: the fourth Pentateuch consists of the Twelve Prophets, in one book, Isaiah, Jeremiah, Ezekiel, Daniel; the two others, over and above the first, are the two books of Ezra, reckoned one book, and Ether. This catalogue is followed by John Damascenus, about the year 380. Jerom, A. D. 393, enumerates 32 books of the old law, according to the number of the Hebrew letters; viz., five books of Moses, Genesis, Exodus, Leviticus, Numbers, and Deuteronomy; eight of the prophets, viz., Joshua, Judges with Ruth, Samuel, Kings, Isaiah, Jeremiah, Ezekiel, and the Twelve Prophets; and nine of the Hagiographa, viz., Job, David or the Psalms, Solomon comprehending three books, i.e., Proverbs, Ecclesiastes, and the Song of Songs; Daniel, Chronicles, Ezra, and Ether. Hence we see, that St.
Jerome’s canon of the Old Testament was that of the Jews. All other books not received by them, he calls Apocryphal. See Apocrypha.

In the catalogue of Rufinus, about the year 397, the books of the Old Testament are enumerated in the following order: viz., in the first place, are the five books of Moses, Genesis, Exodus, Leviticus, Numbers, Deuteronomy. After these are Job, Tobit, Judith, and the four books of the Kings, which the Hebrews reckon two; the book of the Remains, which is called the Chronicler, and two books of Ezra, which by them are reckoned one, and Esther. The prophets are Isaiah, Jeremiah, Ezekiel, and Daniel; and besides, one book of the Twelve Prophets: Job also, and the Psalms of David. Solomon has left three books to the churches, the Proverbs, Ecclesiastes, and the Song of Songs. In the third, otherwise called the sixth, council of Carthage, assembled in 397, it was ordained, that nothing beside the canonical scriptures should be read in the church under the name of Divine Scriptures; and that the canonical scriptures are these, Genesis, Exodus, Leviticus, Numbers, Deuteronomy, Joshua, Judges, Ruth, four books of the Kings, two books of the Remains, Job, Daniel’s Psalter, five books of Solomon, the books of the Twelve Prophets, Isaiah, Jeremiah, Ezekiel, Daniel, Tobit, Judith, Esther, two books of Ezra, and two books of the Maccabees. Upon this canon it has been remarked, that this council was not general, but provincial, or national: that the bishops assembled did not owe much learning or judgment, when they reckon five books of Solomon; that the decree of this council, by placing among canonical scriptures Tobit, Judith, and the two books of the Maccabees, contradicts antiquity, or ought to be explained with a distinction; the word canonical being used laxly, so as to comprehend not only those books which are admitted as the rule of faith, but those also which are esteemed useful, and may be publicly read for the edification of the people: and that this council mentions only two books of Ezra, meaning, probably, the book of Ezra properly so called, and the book of Nehemiah; but nothing is said of the other two, sometimes called the third and fourth books of Ezra. According to Augustine, (De Doctr. Chir. I. ii. c. 8. tom. iii. p. 1. Bened.) about 397, the entire canon of scripture is the following books, which he thus enumerates. There are five of Moses, that is, Genesis, Exodus, Leviticus, Numbers, Deuteronomy; one book of Joshua; one of the Judges; one small book called Ruth, which seems rather to belong to the beginning of the Kingdoms; then the four books of the Kingdoms, and two of the Remains, not following one another, but proceeding, as it were, parallel on the side of each other. These are historical books, which contain a succession of times in the order of events. There are others which do not observe the order of time, and are unconnected together: as Job, Tobit, Esther and Judith, and the two books of the Maccabees, and the two books of Esdras; which let us do more observe the order of a regular succession of things, after that contained in the Kingdoms and Remains. Next are the Prophets, among which is one book of the Psalms of David, and three of Solomon, the Proverbs, the Song of Songs, and Ecclesiastes. For these two books, Wildom and Ecclesiastick, are called Solomon’s for no other reason but because they have a resemblance with his writings; for it is a very general opinion, that they were written by Jefus, the son of Sirach: which books, however, since they are admitted into authority, are to be reckoned among prophetical books. The rest are the books of those who are properly called prophets: as the several books of the twelve prophets, which, being joined together and never separated, are reckoned one book. The names of which prophets are these: Hosea, Joel, Amos, Obadiah, Jonah, Micah, Nahum, Habakkuk, Zephaniah, Haggni, Zechariah, Malachi. After them are the four prophets of larger volumes: Isaiah, Jeremiah, Daniel, Ezekiel. In these 43 books is comprised all the authority of the Old Testament.

From this extrait it appears, that there was not then any canon of scripture settled by any authority, that was universally acknowledged by Christians. Though there might be decrees of councils relating to this matter, they were not deemed decisive and of authority, everywhere, and by all. But till private and inquisitive Christians had a right to use their own judgment concerning this point. Although Augustine says, that Wildom and Ecclesiastick ought to be reckoned among prophetical books, &c.; yet Rufinus and Jerome, who were a little older, must be allowed to bear a right testimony, and to declare truly what was the sentiment of most Christian churches, when they say, that the Wildom of Solomon, Ecclesiastick, Tobit, Judith, and the Maccabees, were indeed allowed to be publicly read: but that nevertheless they were not canonical, and that “the doctrine of religion may be proved by their authority.” From other passages in the works of Augustine it appears, that he acknowledged only 3 books of Solomon to be his; the Proverbs, Ecclesiastes, and Canticles; and that the Jews have no more of his writings in their canon. With regard to the books of Wildom and Ecclesiastick, he observes, that though they were esteemed by some, on account of some resemblance of style and design, to be Solomon’s, the learned are satisfied they are not his; and that they were chiefly respected by the Western Christians. He particularly owns that the book of Judith was not in the Jewish canon. Augustine, indeed, often quotes those books of the Old Testament which we now generally call apocryphal, as Wildom, Tobit, Ecclesiastick, and the Maccabees; but he frequently uses expressions which shew they were not esteemed the books of the prophets, or of equal authority with the books of the Jewish canon. In his “Retractions” (I. ii. c. 20.) he owns his mistake in quoting the book of Ecclesiastick as prophetic; when it was not certain that it was written by a prophet. He also says in another place, (I. ii. c. 20.) that he had not any proof of some propositions which he had advanced, but from the book of Wildom, which the Jews did not receive as of canonical authority: In another work written about the year 420, he says, “The Jews do not receive the scripture of the Maccabees as they do the Law, and the Prophets, and the Psalms, to which our Lord bears testimony, Luke xxiv. 49, that upon the whole, Augusitine feems not to differ from Jerome and Rufinus. For the testimonies of other ancient writers, Chrysostom, Theodoret, Cosmas of Alexandria, Gregory bishop of Rome, Leon
tius, &c. to the Jewish canon, we will refer to Lardner, ubi infra. In the Stichometry of Nicephorus, patriarch of Constantinople, who flourished in the beginning of the ninth century, we have a catalogue of the books both of the Old and New Testament. The divine scriptures mentioned in this work as received by the church and reckoned canonical, are: Genesis, Exodus, Leviticus, Numbers, Deuteronomy, Joshua, Judges, and Ruth, the first and second books of the Kingdoms, the third and fourth of the Kingdoms, the first and second of the Remains, Ezra, first and second, the book of Psalms, the Proverbs of Solomon, Ecclesiastick, the Song of Songs, Job, Isaiah the prophet, Jeremiah the prophet, Baruch, Ezekiel, Daniel, and the 12 prophets. All together, it is said, the books of the Old Testament are 32. The contradicted books are three books of the Maccabees, the Wildom of Solomon, the Wildom
Wisdom of Jeth, the Son of Sarch, Palms, and Odes of Solomon, Esther, Judith, Sifamam, and Tobit, called also Tobias. The writings of the book of Baruch, among the sacred scriptures of the Old Testament, is the only circumstance in which they catalogue differs from that of the Jews; but this, and the omission of Esther, which was not in all ancient catalogues, may be reckoned things of no great consequence. In the Itchomistry prefixed by Catechum to the apostolical constitutions there are 69 books of the Old and New Testament, among which were placed 5 books only, which we call Solomon's, the Proverbs, Ecclesiastes, and the Canticles: the other two, sometimes ascribed to him, Wisdom and Ecclesiasticus, are placed with those, which are out of the 69, or contradictory books. Among the 69 there is but one book of Ezra, probably meaning our Ezra and Nehemiah; but among the apocryphal is a book called the Revelation of Ezra. The book of Esther is not placed among the 69, but in the second class of such as were reckoned useful. See Bible.

The canonical books of the New Testament, received by christians in this part of the world, are the Four Gospels, the Acts of the Apostles, 14 Epistles of St. Paul, seven catholic Epistles, and the Revelation. Dr. Lardner suggests, that the chief canon of the New Testament, is that which may be collected from Eusebius of Caesarea, and which seems to have been the canon of Rome in his time. The canon should consist of two classes: the first consisting of those books, called παπαργίας, which he affirms we were then universally acknowledged, and had been uniformly received, by all catholic christians; these are the four gospels, the Acts of the Apostles, 13 epistles of St. Paul, one epistle of St. Peter, and one epistle of St. John. These only should be esteemed of the highest authority, from which doctrines of religion may be proved. The second class comprehends those books of which Eusebius speaks, called ἡκάκτων, as contradicted in his time, though well known; concerning which there were doubts, whether they were written by persons whose names they bear, or whether the writers were the Apostles of Christ. These are the epistle to the Hebrews, the epistle of James, the second and third of John, the epistle of Jude, and the Revelation. These should be reckoned doubtful, and contradicted; though many might be of opinion, that there is great reason to believe they genuine. They should be allowed to be publicly read in christian assemblies, for the edification of the people; but not to be alleged, as a deciding, alone, sufficient proof of any doctrine. Eusebius reckons a third class of books of the New Testament, called ἐλθαίς, spurious; but Dr. Lardner observes, that there should be no such third class of sacred books; forasmuch as there appears not any reason from christian antiquity to allow of that character and denomination to any christian writings, beside those above-mentioned. This canon is a good one, because it is short, and contains only those books, which were acknowledged by all in the time of Eusebius, and from the beginning; and seven others, which were then well known, and are next in esteem to those that were universally acknowledged; and were generally received as of more authority than any other controverted writings. Nor is there in them any thing inconsistent with the facts, or the principles delivered in the books, universally acknowledged. Moreover, there may be a great deal of reason to think, that they are the genuine writings of those, to whom they are ascribed, and that the writers were Apostles. No other books, beside those now generally received by us, ought to be esteemed canonical, or books of authority. The books contained in this canon, were written by several persons, in several places, and at different times; and it is, therefore, reasonable to think, that it was formed gradually. At the rise of the christian religion, there were no written fables or accounts of it: nor, indeed, was it so, that any books should be written about it, till there were converts to receive and keep them, and deliver them to others. In process of time, the writings of the apostles and evangelists would be repeatedly received by christian profeters, as the written word of God, or sacred scriptures. Those who received them would embrace the opportunities that occurred of conveying them to others; and those who received them so kindly offered of them persevered by those who delivered them. Before the end of the first century, or, indeed, not very long after the middle of it, it is likely there were collections made of the four gospels, and of most of the other books of the New Testament, which were in the hands of a considerable number of individuals and of churches. From quotations of some and from the writings of Irenaeus, Clement of Alexandria, Tertullian, and other writers of the second century, of Origen in the third, and of Eusebius in the fourth century, it appears, that most of the books, now received by us, and called canonical, were universally acknowledged in their times, and had been so acknowledged by the elders and churches of former times. And as to the rest, now received by us, though they were then doubted of, or controverted by some, they were well known, and approved by many. Athanasius, who lived not long after Eusebius, having flourished from the year 326, and afterwards, received all the same books, which are now received by us, and no others. This has been the prevailing sentiment ever since. This canon was not determined by the authority of councils; but the books of which it consists were known to be the genuine writings of the apostles and evangelists, in the same manner that we know the works of Caesar, Cicero, Virgil, Horace, Tacitus, to be theirs. And the canon has been formed upon the ground of an unanimous, or generally-concurring testimony and tradition.

That the number of books to be received as sacred and canonical has not been determined by the authority of any council or councils, universally acknowledged, is apparent from the different judgments among christians, in several parts of the world, concerning divine books, particularly the Epistle to the Hebrews and the Revelation; which were received by some, rejected, or doubted of by others. This was also the case with respect to some of the catholic epistles. No such authority had settled the canon of the New Testament in the time of Eusebius, because he mentions no such thing. There was no catalogue of the books of Scripture in any canon of the council of Nice, A. D. 325. Augustine, A. D. 397, giving directions to inquisitive persons, how they might determine what books are canonical, and what not, does not refer to the decisions of any councils. Cassiodorus, in the fifth century, has three catalogues, one called Jerome's, another Augustine's, and another that of the ancient version; but without reference to the decree of any council, as decisive. And it seems most probable, that in all times, christian people and churches had a liberty of judging for themselves according to evidence; which evidence, with regard to the genuinenesses of most of the books of the New Testament, has been so clear and manifest, that they have been universally received. The genuinenesses of these books was determined by testimony, or tradition. The first testimony is that of those who were contemporaries with the writers of them; and this testimony has been transmitted by others. That the primitive christians formed their judgment concerning the books of Scripture in this way, appears from their remaining works.
works. Influences to this purpose might be collected from Clement of Alexandria, Tertullian, Origen, Eusebius, Athanasius, Cyril, Rufinus, and Augustine. But, besides observing the testimony of writers in former times, they also criticized the books that were proposed to them; examining their style and contents, and comparing them with those books which had been already received, as genuine, upon the ground of an unanxious testimony, and undoubted tradition. Some indeed have said, that the council of Laodicea, held probably A.D. 256, first settled the canon of the New Testament. But it may be justly said to have been settled before. At least, says Dr. Lardner, there had been long before a general agreement among Christians, what books were canonical and what not. From the decree of the council itself it appears, that there were writings already known by the title of canonical. That council, in its last canon, merely declares, "that private plaus might not to be read in the church, nor any books not canonical, but only the canonical books of the Old and New Testament:" after which follows a catalogue or enumeration of such books, in which are rejected the apocryphal books of the Old Testament, and the Revelation in the New Testament. The 47th canon of the council of Carthage, assembled A.D. 397, ordains, "that nothing besides the canonical Scriptures be read in the church, under the name of divine Scriptures." This council's canon of the New Testament is the same as that now received, without any other later writings as canonical; though from the manner in which the Epistle to the Hebrews is mentioned, there is reason to suspect, that it was not so generally received as the other 39 epistles of St. Paul. "We no where read," says Le Clerc (H. E. ann. 100. num. iii. iv. et ann. 29. num. xxii.) "of a council of the apostles, or of any assembly of the governors of Christian churches, convened to determine by their authority, that such a number of gospels, either more nor fewer, should be received. Nor was there any need of it, since it is well known to all from the concursing testimony of contemporaries, that these gospels are the genuine writings of those whose names they bear; and since it is also manifest that there is in them nothing unworthy of those to whom they are attributed, nor anything at all contrary to the revelation of the Old Testament, nor to right reason. There was no need of a synod of grammarians, to declare what are the works of Cicero or Virgil. In like manner, the authority of the gospels has been established by general and perpetual consent, without any decree of the governors of the church. We may say the fame of the apostolical epistles, which owe all their authority, not to the decisions of any ecclesiastical assembly, but to the concursing testimony of all Christians, and the things themselves which are contained therein." Upon the whole, we may conclude, that the writings of the apostles and evangeliasts are received, as the works of other eminent men of antiquity are, upon the ground of general consent and testimony; nor does the canon of the Scriptures of the New Testament owe its establishment to the decisions of councils, but to the judgment of Christian people in general; and the judgment is right and reasonable. If we refer to the writings of ancient authors, we shall find, that they had the same canon of the New Testament with that which is generally received in our times. Accordingly, the catalogue of canonical books furnished by Origen about A.D. 235; Eusebius, A.D. 315; Athanasius, A.D. 326; Cyril, A.D. 347; (the book of Revelation excepted); Epiphanius, A.D. 370; Basil and Gregory Nazianzen, and Amphilochius, A.D. 370; Gregory Nyffen, A.D. 371; Jerom, A.D. 392; Augustine, A.D. 395; Rufinus, A.D. 397; Innocent I. bishop of Rome, A.D. 402; Ifigene of Pelusium, and Cyril of Alexandria, A.D. 412; Caesian, A.D. 424; Prosper of Aquitaine, and Eusebius, bishop of Lyons, and Sedulius, A.D. 433; Leo, bishop of Rome, and Savilian, prebiter of Marselles, A.D. 440; Dicyclus, falsely called the Areopagite, A.D. 452; Gelabius, bishop of Rome, A.D. 494; Andrew, bishop of Cæsarea, A.D. 570; Faunus, an African bishop, and Aristas, A.D. 540; Caedibarius, A.D. 556; Photius, patriarch of Constantinople, A.D. 838; Oecumenius, A.D. 950; Theophylact, A.D. 1070; (the Revelations excepted); and Nicephorus Callisti, A.D. 1337; agrees with that which is now received among Christians. We learn from Paul Sarpi's history of the council of Trent, that one of the doctrinal articles concerning Sacred Scripture, extracted, or pretended to be extracted out of Luther's works, was this: "that no books should be reckoned a part of the Old Testament besides those received by the Jews; and that out of the New Testament should be excluded the Epistle to the Hebrews, the Epistle of James, the second of Peter, the second and third of John, the Epistle of Jude, and the Revelation." And in that council there were some bishops "who would have had the books of the New Testament divided into two classes; in one of which should be rejected those books only which had been always received without contradiction; and in the other, those which had been rejected by some, or about which at least there had been doubts." Dr. Courayer, in his notes, seems to favour this proposal. See his French translation of the history of the council of Trent, (I. i. c. 43. tom. i. p. 235, and c. 47. p. 240. note 1). Concerning the difference of opinions that have fulfilled among ancient and modern writers, with respect to the authenticity of particular books, their authors, &c. see the titles of those books, Hebrews, Peter, John, James, Jude, and Revelation, or Apocalypse. For the time of writing the several books of the New Testament, and other particulars relating to them, see their respective titles. See also Gospel, Acts, Epistle, and Testament. Those who wish to examine this subject more at large, may consult, besides the well-known writings of Cohn, Richardson, Nye, Jones, Lardner, Michaels, Kennett, &c. "Gerhardi de Madrichi Canon Scriptures faciae ecclesiasticus," Jena, 1725; "Schmidtii Historia antiqua et Vindicatio Canonis Sacri V. et N. T.\" Lipsia, 1775, and "Stodchi Commentatio Historico-critica de Librorum N. T. Canon," Franco. ad Vindrum, 1755. Such persons as are acquainted with German literature will find much new and curious information in Dr. Seemler's "Freie Untersuchung," or Free Inquiry into the Canon, 3 vols. 12mo. Halle, 1771-1773; Weber's "Bezyräge zur Geschichte des Canons," Thibingen, 1791, and in Eichhorn's "Repertorium," vol. v. p. 217. Some of the fathers have distinguished the inspired writings into three classes: proto-canonical, deutero-canonical, and apocryphal; which see respectively. Canon, psephal; a table of the moveable feasts, showing the day of Easter, and the other feasts depending on it, for a cycle of nineteen years. The psephal canon is supposed to be the calculation of Eusebius of Cæsarea, and to have been done by order of the council of Nice. Canon, in Monastic Orders, a book wherein the religious of every convent have a fair transcript of the rules of their order, frequently read among them as their local statutes. This is also called regula, as containing the rule and institution of their order. The canon differs from the missale, martyrologium, and necrologium. Canon, again, is used for the catalogue of saints acknowledged and canonized in the Roman church.
**Canon.**

A canon is also used, by way of excellence, in the Romish church, for the secret words of the mass, from the preface to the **Pater**; in the middle of which the priest consecrates the host. The common opinion is, that the canon of the mass commences with *Te lucis*, &c. The people are to be on their knees, hearing the canon; and are to reverence it to themselves, as not to be heard.

The Latin canon is, *canto fuscum, regula, a rule or law.* In speaking of harmonies, in the division of the monochord, it implies the ratio of sounds, or the proportion of sound to sound, when a string is divided by moveable bridges into harmonic intervals. Hence *Eulcid's celebrated tracts on harmonies, as well as Ptolemy's,* is called *fettu canones,* the section of the canon.

But, in musical composition, a canon is a law given by one part to another, or to several parts. As nothing is more difficult to compose than canons, in no species of composition has exercised ingenuity, meditation, and labour, in more various ways than the construction of canons.

In the unison and octave, they are not only more easy to compose, but are more pleasing to hear; as all other canons are moving in two or three different keys at the same time. But canons that are easy to write, and pleasing to hear, are in no collision among masters and profound contrapuntists. They have no more respect for a canon in the unison and octave, than a geometrical for a four in addition; they regard canons as mathematical problems, of which, if the solution is easy, they are unworthy of notice. They are, in reality, more calculated to exercise intellect, than delight the auditor's ear.

Canons in the 5th or 4th obtain the most reverence; but these furtive imitations have been practised in the 2d, 3d, 6th, and even the 5th. But rigid fugues call these only imitations, as the intervals are not familiar. Canons were the last compositions which masters condescended to publish in score. They were regarded as enigmas, which required the deepest sagacity and science to unfold. All the several parts were written on one staff, frequently without specifying when, where, and in what interval the other parts came in. Sometimes, indeed, the composer was so indulgent as to place this character, $^\dagger$, over the first or second of each of the other parts; but without indicating at what distance from the *proposa* or subject, or whether above or below it. At other times the performers were told what kind of canon it was, and how resolved by a Greek or Latin term; that is, on what found the *risposta* or answer. It was to be made. If in the 4th, 5th, 6th, &c. the words *diatessaron, diapente, diatessaron,* &c. occur. If these terms are used simply and unaccompanied, they generally imply that the answer is made in such interval above; but if some expletive is not added to the interval in which the answer is made, the performer is uncertain whether it is above or below the text or subject proposed.

Padre Martini says (Saggio di Contrappunto) that there are so many canons still preserved of the old ecclesiastical composers, each of which is upon some peculiar construction, that it would require a long treatise even superficially to explain them.

A canon that is written and composed in a mysterious and singular manner, is called the Italian *canons chino*; a canon in score, or clearly explained, *canons operto.* A canon written only on one line, and seemingly in one part or melody, sometimes has its solution pointed out by different clefs and rests at the beginning. In old composers, whether the *risposta* is made above or below the subject, is often determined by the Latin particle, *alter,* or *alt,* or by the Greek *hyper,* or *hypo.* So many of the most ancient canons are,
CANON.

To give a list of the principal writers on fugue and canon would be enumerating all the authors who have written on music from the 17th century to the present. The rules have been varied but little from Pietro Aro's time, though new contrivances and new eminences have been multiplied without end.

Composition in plain and florid counterpoint should be studied, and its rules and exceptions well digested by a musical student, before he attaches himself to fugue and canon, which will make him indifferent about melody, provided, under canonical restrictions, he can make his harmony correct.

All that now remains for us to do, in order to smooth the way in this kind of study when the young composer thinks it expedient to undertake it, is to give a few short specimens of the principal kinds of canon that have been cultivated by great masters of the old school, when nothing else was prized, and all their powers were devoted to that almost exclusively.

No writer has more clearly laid down the rules of fugue and canon than Dr. Pepusch, as no one was more deeply read than he was in all the annals of that kind of lore. Mosquera, Padre Martini, Kirnberger, and subsequent writers, may have somewhat extended and detailed the rules more minutely than the venerable graduate of one of our universities; but as far as he goes, we may safely depend on his doctrines. Concerning canon, his precepts are few and short; but of fugues, both precepts and examples are not only numerous, but luminous and indisputable, which rendered it less necessary to be diffuse on canon, as the laws of fugue are the laws of canon, with respect to bringing in the anwers of the several parts; and all the short examples of fugue in Dr. Pepusch's treatise are almost wholly in canon.

After fully treating of regular fugue, and its laws, he says: "Regular fugues are of two sorts: the one is called by the Italians, *fuga logata,* and the other *fuga fidelis.* The first sort is in English generally called canon, and we may express the other by the name of *free fugue.*"

"A Canon is that sort of fugue in which the several parts strictly contain the same melody from the beginning to the end; or in which the guide and the answers are, throughout the whole composition, exactly alike.

"A Free Fugue is not confined to this obligation; for in that we may introduce various subjects, different from the theme on which the fugue began, and break off also at pleasure; however, every subject introduced is a guide, which must have its answer in the same *falsification* (intervals) as itself; and these *free subjects* must also be very regularly introduced, according to the different keys into which the modulation is brought, and which are proper to the chief key of the composition."

It seems as necessary for the accents of the answers to a canon to fall on the same parts of a bar, as in a fugue; particularly in setting words. Even in Sala's excellent examples of canon, when the subject is led off after a minim rest in one part, and a semibreve rest in the *riffage,* or reply, the melody is so disguised, and there is such confusion, that there is no canon, nor hardly an imitation, discoverable by the ear from the beginning to the end; so that all the pains and ingenuity that have been bestowed on the construction are thrown away; and if there is any melody in the first part, it is totally destroyed by the second. For eminent writers on canon, expressly, see Valentini, Michele, Rocco Rodio, and Bevin.

After all that has been said in this long article, in favour of *Canon* as an ingenious contrivance, and of its utility among the studies of young musicians; we must own that *canons* which have no other merit than the difficulty of their construction and solution, should never see the light, being the mere off-spring of pedantry and dulness; but that such laborious works of this kind as are built on agreeable subjects, and are rich in harmony, may, in society, afford great pleasure to real lovers and judges of music, cannot be denied.

**Canon of Ptolemy**, in Chronology, a canon of the Chaldaean, Persian, Greek, and Roman kings, compiled by Claudius Ptolemaeus, who flourished in Egypt in the reigns of Adrian and Marcus Antoninus, about A.D. 150, from the annals and histories of the several kingdoms to which it relates, and esteemed an invaluable treasure in the science to which it is subservient. It has been preferred in Commentaries of Theon, and published by Overall and Petaurus from two MSS. in the royal library at Paris. In this canon the author computes from the epoch of the Nabonassarian æra, and from that day of the month on which the Egyptian Thoth fell. The years made use of are Egyptian, and consist of 365 days, without intercalulation. In every reign the years are reckoned as complete; and those reigns which are less than a year, are omitted, whether they comprehended a Thoth or not. This defect was, in some degree, supplied by additions to other reigns; yet it appears in history, that a year was now and then superseded. The first part of this canon has been improperly entitled "Ptolemy's Canon of the Kings of the Assyrians and Medes," as it includes none but kings of Chaldaea or Babylon.

**Canon of Ptolemy.**

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Kings who reigned after Alexander

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<td>439</td>
<td>Prolemes Notius</td>
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Playfair's Chronicle, p. 312.

CANON, in Geometry and Algebra, a general rule for the solution of all cases of a like nature with the present inquiry. Thus every letter of an equation is a canon; and, if turned into words becomes a rule to solve a question of the same nature with that proposed.

CANON, natural, of triangles, is a table of sines, tangents, and secants together; so called, because serving principally for the solution of triangles.

CANON, artificial, of triangles, is a table wherein the logarithms of sides and tangents are laid down. See SINE, under which article the method of constructing the natural and artificial canon will be explained. See also GUNTER, Gunter's Line, Scale, and Sector.

CANON Law, a collection of ecclesiastical constitutions, decisions, and maxims, taken partly from Scripture, partly from the decrees of general and provincial councils, and partly from the decrees of the popes and bulls of the holy See, and the reports of the fathers of the primitive fathers, whereby all matters of policy in the Roman church are regulated.

"If the canon law," says Dr. Robertson (Hist. Charles V. vol. i. p. 74, &c. Svo.) "be considered politically, either as a system pursued on purpose to subvert the clergy in usurping powers and jurisdiction, or else repugnant to the nature of their function, than inconsistent with the order of government; or as the chief instrument in establishing the dominion of the popes, which shook the throne, and endangered the liberties of every kingdom in Europe, we must pronounce it one of the most formidable engines ever formed against the happiness of civil society. But if we contemplate it merely as a code of laws respecting the rights and property of individuals, and attend only to the civil effects of its decisions concerning that, we must view it in a different, and a much more favourable light." It is not easy to fix with precision the period at which ecclesiastics first began to claim exemption from civil jurisdiction. In the early and purest ages of the church, they made no pretences to such immunity. The authority of the civil magistrate extended to all persons, and to all cases. But in ages of ignorance and credulity, the ministers of religion became objects of universal reverence. Accordingly we find in Tacitus (de Mor. Germ.) that priests were highly revered by the Germans, and that they presided in the assembly of the people. They alone were permitted to chastise, to bind, and to punish; which they did, not by order of the prince, or of his ministers of justice; but, as by an inspiration of that Deity, who is always present to those who make war. When the barbarians who overran the empire first embraced the Christian faith, they found the clergy in possession of considerable power, and they naturally transferred to these new guides the profound submission and reverence which they had been accustomed to yield to the priests of that religion which they had forsaken. The clergy, whose function was regarded as sacred, availing themselves of the advantage which the superstition and credulity of mankind afforded them, gradually emancipated themselves from subjection to the profane jurisdiction of the city and to civil courts; and extended that indulgence which seems at first to have been merely an act of complaisance, flowing from reverence of their character, into a legal exemption. Hence they proceeded to establish courts, in which every question relating to their own character, their function, or their property, was tried. Upon different pretexts, and by a multiplicity of artifices, they communicated this privilege to so many persons, and extended their jurisdiction to such a variety of causes, that most concerns which gave rise to litigation were drawn under the cognizance of the spiritual courts.

Du Cange, in his Glossary (Voc. Curia Christiianatatis) has collected most of the causes with respect to which the clergy arrogated an exclusive jurisdiction, and refers to the authors, or original papers, which confirm his observations. Gian-Ni, in his Civil History of Naples, (l. xix. § 3.) has ranged these under their proper heads, and scrutinizes the pretensions of the church with so much boldness and confidence. M. Fleury observes, (Hist. Eccl. tom. xix. Disc. Prelim.) that the clergy multiplied, at such a rate, the pretexts for extending the authority of the spiritual courts, that it was in their power to withdraw every person and every cause from the jurisdiction of the civil magistrate. The ambitious project of erecting a spiritual monarchy, superior to all others, even in worldly power, was manifested by the whole conduct of the bishops of Rome, and of the clergy generally, in their relations with them, both before and after the period in which the canon law was perfected. This appears in the canons enacted by their councils for the government of that monarchy; and it was very signally displayed in the canons of the provincial synod, held at Merton in Surrey, A. D. 1258, by Doniface, archbishop of Canterbury. The first canon of that synod forbids archbishops, bishops, and inferior clergy, to appear before civil courts to answer for any part of their conduct which had the most remote relation to church affairs; and threatens the judges, and even the king himself, with the highest censures of the church, if they infringe on such appearance. The second relates to patronages; and the third is against the intrusion of clerks into benefices by a lay power. The fourth makes such regulations concerning excommunication, as rendered that sentence truly terrible. The fifth forbids laymen to imprison clergymen. In the sixth, the church claims a right of judging concerning contracts between a clergyman and a layman. The seventh affords a right of the church to judge and punish Jews. The eighth provides for the perfect security of those criminals who had taken refuge in churches. The ninth, tenth, and eleventh, are designed to prevent all invasions of every kind in the possessions of the church and clergy, which are declared sacred and inviolable. And the two last provide...
The first "Syntagma" of canon law was composed by John the Scholastic, a priest of Antioch, in the sixth century. He is also the author of the "Nomo-Canonon." Both were published at Paris in Juyfelle's "Bibliotheca Juris Canonici," tom. ii. In the ninth century, the celebrated Photius compiled his "Syntagma Canonum," and his "Nomo-Canonon." The former has not been published; but the latter was given with a Latin version and Balfon's commentary, by Juyfelle, at Paris, 1615.

The canon law that obtained throughout the whole of the twelfth century, was the collections of canons, "Codex canonum," compiled by Dionysius Exiguus, in 526, and published by Juyfelle in 1628, and improved by Lidore of Seville, who appropriated them to the discipline of Spain; the capitularies of Charlemagne, and the decrees of the popes, from Siricius to Anastasius. No regard was had to any thing not comprised in these; and the French have since maintained the rights of the Gallican church to confit in their not being obliged to admit any thing else, but to be at liberty to reject all innovations made in the canonical jurisprudence since that compilation, as well as papal decrees before Siricius.

Indeed, between the eighth and eleventh centuries, the canon-law was mixed and confounded with the papal decrees from St. Clement to Siricius; which till then had been unknown: this gave occasion to a new reform, or body of the canon-law, or harmony of discordant canons; which is the collection still extant, under the title of "Concordia Discordantium Canonum," first made by Ivo, in 1144, and perfected in 1154, by Gratian, a Benedictine monk, from texts of Scripture, councils, and sentiments of the fathers, in the several points of ecclesiastical polity; and containing those constitutions which have been denounced, by way of eminence, the Decrees, and forming the first part of the canon-law. These are the most ancient, as they commence from the time of Constantine, the first Christian emperor of Rome, and they reached as low as the time of pope Alexander III. It is now generally known by the name of the "Decretum" of Gratian, which was formed in imitation of
the Pandects of Justinian; and is a confused immemorial
compilation, full of errors and forgeries.

The second part of the canon-law consists of the decrees
of the popes, from the time of pope Alexander III. to pope
Gregory IX., and published, under the auspices of that pope,
by Raymondus Bazenius, about the year 1230, in five
books, entitled "Decretalia Gregorii Nom." 

In 1409, pope Boniface VIII. continued the papal
decrees as far as his time, under the title of "Secundus
Decretalium." To these, pope John XXII. added the "Clement-
ine," or the constitutions of his predecessor Clement V.
approved by the council of Vienne, and full authenticated
about the year 1317. And to all these were afterwards
added twenty constitutions of the said pope John, called
the "Extravagantes," and some other constitutions of his
successors, called "Extravagantes Communes." These are
usually called the DECRETALES.

All these, viz. Gratian’s decrete, Gregory’s decretals, the
sixth decretal, the Clementine constitutions, and the extrava-
gantes of John and his successors, form the "Corpus Juris
Canonicus," or body of the Roman canon-laws, which,
including the comments, make three volumes, in folio; the
rule and measure of church government. As the decrees set
out the origin of the canon law, and the rights, dignities,
and decrees of ecclesiastical persons, with their manner of
election, ordination, &c. so the Decretals contain the law
that is to be used in the ecclesiastical courts; and the first title in
every one of them is the title of the blessed Trinity, and of
the catholic faith, which is followed with constitutions and
customs, judgments and determinations in such matters and
casus as are liable to ecclesiastical cognizance, the lives and
conversion of the clergy, of matrimony and divorces, in-
quisition of criminal matters, purgation, penance, excommuni-
cation, &c. But some of the titles of the canon-law are now
out of use, and belong to the common law; and others are
introduced, such as trials of wills, bastardy, defamation, &c.
Beneath these pontifical collections, which during the times of
popery were received as authentic in this island, as well as in
other parts of Christendom, there is also a kind of national
common-law, composed of "Regatus" and provincial consti-
tutions, and adapted to the exigencies of this church and king-
dom. See Constitutions. At the dawn of the reformation,
in the reign of Henry VII. it was enacted, that the
canon-law should be reviewed; and till that review took
place, such canons, constitutions, ordinances, and synods
provincial as had been made, and were not repugnant to the
law of the land or the king’s prerogatives, should still be used
and executed. The review was proposed again in the reign of
Edward VI. and of Queen Elizabeth; but as it was never
accomplished, the authority of the canon-law in England
depends upon the statute of the 25th Henry VIII. c. 19,
which was repealed indeed by Queen Mary, and again revived
and confirmed by 1 Eliz. c. 1.

As to the constitutions and canons made in the convoca-
tion of the province of Canterbury in 1263, ratified by the
king, and soon after adopted in the province of York; these
never obtained a parliamentary confirmation; and it has been
therefore adjudged upon the principles of law and the consti-
tution, that where they are not merely declaratory of the ancient
 canon-law, but are introductory of new regulations, they do not bind the laity, however the clergy may regard
them. Strang’s Rep. 1672.

Lord Hardwicke cites the opinion of Lord Holt, and de-
clares it is not denied by any one, that it is very plain all the
clergy are bound by the canons, confirmed merely by the
king; but they must be confirmed by the parliament to bind
the laity. 2 Atk. 825.

There are four species of courts, in

which the canon (and civil) laws are permitted, under cer-
tain restrictions, to be used. The courts of the archbishops
and bishops, and their derivative officers; usually called in our
law courts, Chancery, or the ecclesiastical courts. 2. The
military courts, or courts of chivalry. 3. The courts of
Admiralty. 4. The courts of the two universities. Their
reception in general, and the different degrees of their re-
ception in all these courts, are grounded entirely upon cus-
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CANONESS, in the Roman Church, a woman who enjoys a prebend, affixed by the foundation, to maids; without their being obliged to renounce the world, or to make any vows. There are few of these, except in Flanders and Germany; they are rather looked upon as a female race and retreat of girls for marriage than an engagement for the service of God.

Canonesses of St. Augustine, or Regular Canonesses, are a kind of religious, who follow the rules of St. Augustine, of which there are various congregations. The order of canonesses was first instituted by Lewis the Meek, in the beginning of the ninth century.

Canonesses, in Modern History, a denomination given in Belgium to the registers of land, and hereditary expanders of the uages of the country. They have every where their officers and deputies, and are not liable to removal; and all papers attested by them are received as authentic and decisive in disputes concerning lands and their boundaries.

Canonheriis, Peter, Andrew, in Biography, the son of a physician of eminence at Genoa, under whom he received the rudiments of his education, which he completed at Parma, where he applied with equal industry to the study of medicine and jurisprudence. In 1604, probably on his being created doctor in philosophy, medicine, and theology, he published at Parma "Conclusiones philosophicae et medicinae," 4to. and the same year "De admirandis Vini Viticulture," 8vo. Antwerp; in 1607, "De Cunivola Doctora Libri quinque," 4to. Florissant. But his principal work is, "In septem Aphorismorum Hippocraticis Libros, medicae, politicae, morales, ac theologice Interpretationes," Ant. 1618, 2 tom. 4to. But the labour of the author has rather obscured, than elucidated the texts he meant to explain. Haller Deh. Med. Eloy. Diet. Hill.

Canonica, in Philosophical History, an appellation given by Epicurus to his doctrine of logic. It was called canonica, as consisting of a few canons, or rules, for directing the understanding in the pursuit and knowledge of truth: and it is represented as a very flight and insufficient logic, by several ancients who put a great value on his ethics and physics. The fables of Epicurus's canonica consists in his doctrine of the criteria of truth. All questions in philosophy are either concerning words or things: concerning words, concerning things, they seek their truth; concerning words, their signification: things are either natural or moral; and the former are either perceived by sense, or by the understanding. Hence, according to Epicurus, arise three criteria of truth, viz.: sense, anticipation or premonition, and passion. The great canon, or principle, of Epicurus's logic is, that the sense is never deceived; and therefore, that every sensation, or perception of an appearance, is true. Stanley's Hill. Phil. p. xiii. p. 35. See Epicurean Philosophy.

Canonica is also used by some ancients to denote the art of music: and it is more particularly used to denote that species of music, which does not determine the intervals of sounds by the ear, but by a canon or fretted chord. See Canon.

Canonical, something that belongs to, or partakes of the nature of a rule or canon: and amounts to much the same with what we otherwise call regular.

Canonical is an appellation more peculiarly given to those writings which have been received as the rule of our faith and practice, and comprehended in the canon or catalogue of the Scriptures. In which sense, canonical stands contradistinguished from apocryphal. Divines generally hold, that those books only of the New Testament are to be accounted canonical, which were either written, or at least approved and authorized by the apostles. Formerly they were not so well distinguished as among us. In the first ages of the church, Dodwell observes the genuine writings of the apostles used to be bound up together with those now called pseudepigraphi, and apocryphal; so that it was not manifested, by any public judgment, which of them was to be preferred to the other; but later times thought fit to make a separation.

The Jews allow of no books for canonical, but those written before or soon after the return from the Babylonish captivity, when the gift of prophecy ceased among them. In determining the question, what books are canonical, and what are apocryphal, some have had recourse to the authority of the church. Accordingly, the papists have generally affirmed, in their controversies with the protestants, that the authority of the Scriptures depends upon, or is derived from the power of the church; or, in other words, that it is in the power of the pope, or council, or both, to determine what books shall be received as canonical. Others are of opinion, that there are innate evidences in the Scriptures themselves, which, applied by the illumination or testimony of the Holy Spirit, are the only true proofs of their being canonical, or the word of God. The insufficiency of these two modes of decision has been examined and evinced by several writers, and particularly Mr. Jones, ubi infra. The principal, and without doubt, most unexceptionable and satisfactory method by which this question can be determined, is tradition, or the well approved testimonies of those who lived in, or near the time when the books supposed to be canonical, were written. To this purpose Mr. Jones alleges, that the several books of the New Testament, at their first writing, were published abroad to the world, and delivered to the first churches in distant countries, for their use; and they who first received them knew them to be the books of the persons under whose names they were published, and could, and did testify to the succeeding ages, what they thus knew of the facts. This testimony of the primitive churches is still faithfully preferred in the writings of the ancient Christians, and is, therefore, not only a good and sufficient, but the principal means by which we know the truth of the fact, viz. that the books were written by such and such men. Besides, the books contain in themselves evidences of their excellency above all others, which should serve to confirm our faith; and, for our farther help, we may hope to obtain the influences of God's Holy Spirit, to clear our judgments, and free us from prejudices, to help us to perceive the former evidences in their due strength, and to impress the things revealed on our minds, as to produce a suitable conduct. Moreover, those books which are mentioned in the catalogues made by the most ancient Christian writers of the sacred and inspired books, are to be esteemed canonical, and those which are not found in any of these catalogues, must be considered as apocryphal. And farther, those books are justly esteemed canonical, which the first writers of Christianity have cited in their writings as Scripture, and those apocryphal which they have not so cited. Besides, those books are canonical, which the primitive Christians read in their churches, or public assemblies, as the Scriptures or word of God. Jones's new and full Method, &c. vol. i. See Canon and Apocryphal.

Canonical, pseuf, or deutero-Canonical. See Canon, and Deutero-Canonical.

Canonical is also an appellation given to those epistles in the New Testament, more frequently called catholic, or general epistles.

Canonical, canonicus, was also an appellation given to all the officers and ministers of a church or monastery, from the
the bishop or abbot to the meanest servant, including priests, monks, virgins, and all who were entered in canon, that is, in the matricula or register of the church.

Canonical benefice, canonici egoi, was an ancient tax, or tribute, imposed on certain provinces, whereby they were obliged to furnish the emperor with so many horses to mount his cavalry.

Canonical benefices, or certain fixed incomes of the day, were certain of the clerics, more especially under the Roman church, to the office of prayer and devotion. Such were matern, salubris, beneficia, benefices, beneficium. In our country the canonical hours are from eight to twelve in the evening, before which marriage cannot legally be performed in any parish church.

Canonical infliction, a regular and legitimate collation to a heretic, agreeable to the rules of the canon law.

Canonical letters, in the Ancient Church, were a sort of testimonials of the orthodox faith, which the bishops and clergy sent each other, to keep up church communion, and distinguish orthodox Christians from Arsy, and other heretics. When they had occasion to travel into other dioceses, or countries, dignitary and recommendatory letters, also letters of peace, &c. were so many species of canonical letters. See DISMISSAL.

Canonical liberty, a freedom to which certain churches are left, being governed by the ancient canons and usages established before the papal hierarchy was carried to its height; such as that which, of later days, the French call the Gallican liberty.

Canonical life, the method or rule of living preferred by the ancient clergy who lived in community. The canonical life was a kind of medium between the monastic and clerical lives.

The orders of monks and clerks were originally distinct; but, in the process of time, pious persons instituted colleges of priests and canons, where clerks, actually engaged in the ministry, or admitted for it, might live under a fixed rule, which, though somewhat more easy than that of the monks, was nevertheless more restrained than the secular. This was called the "canonical life," and those who embraced it, "canons." Authors are not agreed concerning the founder of the canonical life. Some ascribe it to the apostles; others refer it to pope Urban I., about the year 1230, who is said to have ordered bishops to provide each of their clergy as were willing to live in community with necessities out of the revenues of their churches. Most writers ascribe it to St. Augustin, who, having engaged a number of clerks to devote themselves to religion, instituted a monastery within his episcopal palace, where he lived in community with them. Onuphrius Peninus says, that pope Gelasius I., about the year 495, placed six regular canons of St. Augustin in the Lateran church.

Canonical obedience, is that communion which by the ecclesiastical laws the inferior clergy are to pay to their bishops, and religions, to their superiors.

Canonical portion, is the amount of the estate of a person deceased, as the canons allow to the parish church to which he belonged.

Canonical punishments are those which the church may inflict: such are excommunication, degradation, and penance, in Roman catholic countries; also excommunication, alms, whipping, &c.

Canonical purgations were ancient methods of proving innocency by ordeal, purgation, &c. See also CONFIRMATION, Oath, &c.

Canonical fines, in the ancient church, those which were capitul or mortal; such especially were idolatry, adultery, murder, heresy, and schism.

CANONICUM, in a general sense, denotes a tax, or tribute.

CANONICUM is more particularly used in the Greek church, for a tax paid by the clergy to bishop, archbishops, and metropolitans, for their use, and the support of their honours.

CANONICUM also denotes a duty of thirds, paid by the Greek laws to their bishops, or, according to Du Cange, to their priests. The canonicum is assessed according to the number of monks, or clerics, in a place.

The emperor Justinian Canonicus made a constitution for regulating the canonic ton of bishops, which was confirmed by another made in 696, by his nephew Alexius Comnenus. A village containing thirty fires, was to pay for its canonicum, one piece of gold, two of silver, one sheep, six bushels of barley, half a bushel of wheat, six measures of wine, and thirty loaves. Du Cange, Glos. Gr. tom. i. p. 578.

CANONIST, a person skilled in, or who makes profession of, the study and practice of the canon-law.

Canonists and civilians are usually combined in the same persons. And hence the title of dexter juris uritius, or legum doctor, usually expressed in abbreviation, L.L. D. or J.L. D.

CANONUM, in ancient Geography, a place of the isle of Albion, on the route from Venta Lancorum to Londonium, between Cambodunum and Caeranomag, according to Antonine's Itinerary. Mr. Camden has placed this station at Chelmsford, and Dr. Gale hath fixed it at Little Canfield.

CANONIZATION, a declaration of the pope, whereby, after a great deal of solemnity, he enters into the list of saints some person who has lived an exemplary life, and wrought miracles; or, as is often the case, performs some singular service for the church, in which a principal part of this kind of merit consists. See BEATIFICATION.

The word canonization seems to be of later origin than the thing; there being no influence of the use of the word before the twelfth century, whereas St. Ulrichius was canonized in the tenth. The term is formed from canon; because the primitive canonizations were only orders of the popes, or bishops, whereby persons eminent for piety, &c. were inserted in the canon of the mass, that they might be commemorated in the service; because, in those days, the use of martyrologies was unknown in the church. Mabilon distinguishes two kinds of canonization; a general, and particular; the first made by a general council, or a pope; the second, by a bishop, a particular church, or a provincial council. There are instances likewise of canonizations, or at least of something very like them, by abbots.

At first, only martyrs were canonized; but by degrees they came to confessors, &c.

Canonization was anciently confined in infecting the saint's name in the sacred dupplex, or canon of saints; in appointing a proper office for invoking him, and erecting churches under his invocation, with altars for masses to be celebrated on; taking up the body from the place of its first burial, and the like ceremonies: by degrees, other formalities were added; and processions were made with the saint's image in triumph; the day of his death was declared a feast; and to render the thing fill more solemn, Honorius III. in 1225, added several days indulgence to a canonization.

It is a great dispute among the learned, when the right of canonization, which it is owned was anciently common to ordinaries, especially metropolitans and princes, with the pope, became first peculiar to the pope. Some say, Alexander.
The subject of Antwerp, in their Propylæum, affix, it was not established till two or three ages ago; and then by a mere custom, which passed tacitly into a law, which appears not to have been generally received in the tenth and eleventh centuries. This, however, is pretty certain, that it was generally allowed before pope Alexander III., but since his time we read of no faults canonicæd by any but the popes, to whom he is said to have restricted the privilege and cognizance of canonization; and the archbishop of Vienne in France, and his suffragans, acknowledged it in an authentic manner in the year 1271, by a letter written to Gregory IX. deferring him to canonize Stephen, bishop of Die, who died in 1208. "Quia nemo," they say, "quoniam meritorum prærogativa pulest, ab ecclesia Dei pro faciendo habendus, aut venerandus ess, nil prius per sedem apostolicam ejus fæatus fuerit approbatas.

**CANONICAT**, in Geography, a small island of North America, in Newport county, Rhode island, extending south nearly as far as the south end of Rhode island, and north about seven miles, its average breadth being about one mile; the south shore forming the west point of Newport harbour, and the west shore being about three miles from the Narragansett shore. On this point is Jamestown. It was purchased of the Indians in 1657, and in 1678 incorporated by the name of Jamestown. The soil is luxuriant, producing grain and grapes in abundance. Jamestown contains 507 inhabitants, including 16 slaves.

**CANONNIERE** is a small loophole or opening made in a wall, for firing through with a musket or sable. Thus canonniere de retrachements are openings made in the soldiers' huts or cabins, for firing through on the enemy. The word is now in general use, of canonniere being substituted in its stead. The name of canonniere, however, was formerly given to embrasures.

**CANONIER** is also a fort of tent, in which infantry and cavalry lodge on a campaign. One of them, like a hut or cabin, holds seven men. They are of different forts and sizes, according as they are intended for the accommodation of infantry, cavalry, fuitlers, servants, and officers. For a description of their forms or figures, see the article CASTRAMETATION.

**CANONY, or CANONICATE, the benefice filled by a canon. Canonicate is dilLATED from prebend, in that the prebend may fit without the canonicate, whereas the canonicate is imparable from the prebend. It is to the canonicate, not to the prebend, that the right of suffragances, and other privilages, are annexed. See PREBEND.

**CANONSBUY, in Geography, a town of North America, in Washington county, Pennsylvania, pleasantly situated on rising ground, near the north side of the west branch of Chartier's creek. 18 miles S.W. from Pittsburgh, and 9 miles N.E. from Washington. It contains about 100 houses, and two meeting-houses, one belonging to the Presbyterians and the other to the Seceders. Its academy is flourishing, and a charter was lately granted in the formation of the assembly for a college. In its vicinity are several valuable mills.

**CANOPICUM, in Ancient Geography, a town of Africa Propria, situated between the town of Tabraca and the river Bagradas. Pliny says, that it was inhabited by Roman citizens. It is the "Canopica" of Ptolemy.

**CANOPUS, in Astronomy, a bright star of the first magnitude in the rudder of Argo, a constellation of the southern hemisphere. See ARG.

The longitude of Canopus, as given by Halley, for the year 1705, is 10° 52' of Cancer, and its southern latitude, 75° 49'. F. Noel, in 1697, found its right ascension 93° 54', its declination southwards, 52° 29'. F. Tencille, in the beginning of March 1705, observed the declination of canopus 52° 50' 4'. F. Thomas, in January 1682, found the declination 52° 51' 33', its right ascension 95° 32' 20", longitude, 8° 54' 50".

**Cancer, latitude southern 75° 55°**.


**CANAUS, in Ancient Geography, a town of Egypt, seated at the distance of 120 stadia from Alexandria, near the sea, and at the extremity of the western branch of the Nile, hence called "Olbian Canopicum," or the Canopic branch. This branch commences near Ptolemais or Pough, crosses the lake of Behir or Bahira, and falls into the fec near the feet of Canopus. Near its termination is the lake "Madid" or "Maadie," denoting in Arabic "passage," which is the remains of this branch. This lake is, at present, only a saltwater lagoon, which has no communication with the Nile, except at the time of its greatest increase. It is passed on horseback, when the overflowing of the river, or a continual fresh, has not augmented the depth of the water. In other cases it is crossed in a boat, but the pass is very unsafe and incommodious. The mouth of this ancient branch of the Nile is very narrow, and formed by a bank of sand. On the eastern bank stands a large square building, resembling in its construction that of the French factory at Alexandria, and of all the Caravanseries in Egypt. Beyond Maadie towards the site of Canopus, from which the sea forms an immense bight, the sea-shore is so low, that it became necessary to raise ditches or embankments of solid construction and of considerable extent for keeping out the sea, which covered a part of the adjacent ground as long ago as the time of Strabo, and which in bad weather still overflows the dykes, extends as far as the promontory of the prent Aboukir, and inundates a great space of land. Upon these dykes small towers are erected at some distance from each other. The town of Canopus, which is said to have been built by the Laocæmonians, and which is mentioned by several ancient writers, as Pliny, Tacitus, Seneca, and Juvenal, &c. was erected upon a rock, forming a handy road for shipping, and elevated above the reach of inundations. Pliny, who collected the testimonies of antiquity relating to this place, says, that it was formerly an island; and the Periplus of Scylax points out a defect island near the Canopic mouth: the local situation of Canopus renders this account credible. The remains of this ancient city occupy a vast extent of ground, which is strewn with ruins that present many objects of admiration to the curious inquirer. The columns of beautiful granite that are found among these majestic ruins, called by the inhabitants of Aboukir, the city of Pharaoh, are of alluring magnitude, and their capitals are of the finest workmanship; some of these columns were not long ago standing, together with a large arch that formed the entrance to a subterraneous cavern; but they have recently been destroyed by the natives for the sake of the stones, which they employed in their buildings and in repairing the dykes that confine the sea. On the sea-shore are still observable, the foundations of a very large, regular building, in the midst of which is a cavern leading to the sea, where ruins are to be seen at a great distance. Blocks of granite of different forms
forms lie scattered among the ruins of antiquity, and in the midst of these occasionally covered by the sea, which has made considerable encroachments, is a colossal statue of a woman, made of granite, fluted through its whole length, and in some of its parts mutilated, which the people of the country conceive to have been the figure of Pharaoh's daughter. By the side of the statue is a very large sphinx, partly mutilated, the pedestal of which is encircled with hieroglyphics almost effaced. The columns of granite with which this place abounds, are probably parts of the magnificent temple, consecrated to the honour and for the peculiar worship of Serapis. Foreigners from the most distant provinces, but particularly from Alexandria, resorted hither in crowds, attracted rather by the pleasures they might enjoy in the city, than for the purpose of offering sacrifices to the god. The priests were, indeed, consulted as physicians, than as interpreters of the oracle, and they were occupied in reciting the marvellous oracles that were performed here, the honour of which they attributed to Serapis. We need not wonder that this should be a place of great resort, when we consider that the surrounding country, inhabited by the Nile, was clothed with the riches of nature, and that the city afforded all the enjoyments of luxury in the greatest profusion. The attractions of the situation, the beauty of the climate, the delicacy of the table, the general affluence of the people, and, in short, the pleasures of every kind, which seemed to have made this their favourite abode; all concurred to make Canopus the most enchanting retreat, and to render its inhabitants the happiest of all people.

"Felici gens fortunata Canopi,"

says Virgil, Georg. i. iv. But diffusion had here attained its highest pitch; licentiousness knew no bounds. Strabo (i. xvii. vol. ii. p. 1153) informs us, that the canal which passed from Alexandria to Canopus was covered night and day with boats, full of men and women, who sang and danced in the most lewdish manner. To the same purpose Seneca observes, (Epist. 51) that if a page wished for retirement, he would not choose Canopus as a place of retreat. Juvenal, when he is representing in strong terms, the degree in which the manners of the Romans were corrupted, says, that Canopus itself condemned them:

"--- Et moris urbis dammate Canopo."

Upon or near the ruins of ancient Canopus, is built the present Abukir, called by mariners, Bekir, which has a cable built upon the point, a cape which permits a considerable way into the sea. Some shallows stretching out beyond the cape enclose, in a large bay which is here formed by the coast, a small harbour, where vessels lie in safety, at the foot of the castle, in the front of which is a good roadstead; this was the usual anchorage of French frigates, which cruised in these seas. It was also frequented by merchant-ships, when they were obliged, from bad weather, to quit the new and dangerous port of Alexandria; and likewise by the country "germs" when they could not make Alexandria, or clear the "Boghafs" of the Nile at the mouth of the Rosetta branch. In this roadstead the valiant and now (1806), much lamented lord Nelson obtained his glorious victory over the French fleet. See ABUKIR.

CANOPUS, in Pagan Mythology, an Egyptian deity, as some have supposed, whole divinity probably originated in a Greek fable. The Greeks were fond of tracing the arts, sciences, and theological opinions and rites of other nations to a Greek origin. Accordingly they relate, that Menelaus, in his return from Troy, stopped to refit his ships and refresh his crew on the coast of Egypt, near one of the mouths of the Nile; and that, during his stay, Canopus or Canopus, his chief pilot, was bitten by a viper, and fell a victim to this accident. The city of Canopus, they say, was erected over his tomb, and derived its name from him. This etymology of Canopus is mentioned by Strabo, ad supr. But through Herodotus, they say that Menelaus had been in Egypt, and had taken notice of the city called Canopus, he does not see a word of Canopus, or of his death. This Greek fable, however, was repeated in the fourth century by Epiphanius, (Joan. iv. p. 10. edit. Petavius) who has made Canopus a particular deity of the Egyptians. Rufinus also has repeated it. (Hist. Eccles. iv. c. 26.) The Chaldeans, it has been said, who worshipped fire, called their sacred deity through many countries, in order to exvise his power to be superior to that of other deities; and as he obtained a complete victory over all the other gods of wood, bronze, iron, and gold, his dominion was established, or his claim to worship acknowledged. The priests of Canopus, when they heard of this triumph, determined to give their deity an opportunity of contending with that of the Chaldeans. They represented Canopus under the form of vessels pierced with a great number of holes, which were filled with wax, in which they were anointed, to purify the water of the Nile; and having dipped one of these vessels with water, and painted it with different colours, they fitted it to its surface the head of an idol of human shape; and then brought it out to contend with the Chaldean deity. The Chaldeans accordingly kindled a fire all round it; but when the heat had melted the wax, the water gnashed out through the holes, and extinguished the fire; and thus, it is said, Canopus conquered the god of the Chaldeans. As a proof that such an Egyptian deity as Canopus actually existed, it has been alleged, that the geographer, Dionysius Periegetes, calls the city of Canopus, the celebrated temple of Canopus of Amymele:

"Kal tismes pei'tous 'Aymemelis Kanopi."

"There stands Canopus temple known to fame;"

"The pilot, who from fair Amycla came."

This passage, however justly interpreted, affords no evidence that a particular god, called Canopus, had a temple in that city. Homer (Il. B. v. 657.) calls the territory of Pyrrhus "the temple of Ceres," because its fields were very fertile in corn. Thus also Pindar (Pyth. 127.) calls Lybia and the "whole of Egypt," the "fertile temple of this Nile." By a similar metaphor, Dionysius might have called the city of Canopus, which he believed to have derived its name from the Maufoilium of Canopus, "the temple of the pilot of Amymela." The temple of Canopus was that of Serapis; and this deity was worshipped in other countries besides Egypt, under the appellation or distinction of Serapis of Canopus. The singular form under which Serapis was worshipped at Canopus will serve to lead us into an acquaintance with the nature and attributes of this deity, which were different from those of the Serapis or Pluton, brought by the Greeks to Alexandria. This was a bottle, or vessel, as we have above mentioned, made of a very precious clay, which served to filter the water of the Nile, or to render it clear and fit for drinking. The inhabitants of Canopus found this clay in their neighbourhood, and they carried on through Egypt an extensive commerce in these filtering vessels. The medals of Canopus, struck in honour of Adrian, present one of these vases surmounted with a serpent, which was, without doubt, the good genius, αγαθος Διαμουρ. This name of good genius had been given to the branch of the Nile which flowed near Canopus. Hence we may conclude, that the great divinity of the Canopians.
Canopia was the good genius of the Nile, and that it was represented by a floating vessel; but the god of the Nile, which pursued its course in the Canopic branch, was transformed by the Greeks into Serapis. Accordingly they worshiped at Alexandria Serapis-Ptolema, and at Canopus, Serapis of the Nile. Many Egyptian 'vak,' called 'serapiamons,' are preferred in the collections of Antiquities; some of which may reasonably be supposed to represent the Serapis of the Nile.

**CANOPY**, in Architecture and Sculpture, a magnificent kind of decoration, formerly to cover, and crown an altar, throne, tribunal, pulpit, chair, or the like. See BARDACH.

The word is formed from the barbarous Latin canopus, of occasion, a net spread over a bed to keep off the gods, from canus, a net.

Canopics are also borne over the head in processions of state, after the manner of umbrellas.

The canopy of an altar is more peculiarly called Canorus.

The Roman grandees had their canopics, or spread veils, called stufa, over their chairs; the like were also in temples over the statues of the gods. The modern cardinals' still retain the use of canopics. The canopy, as we render Κανοπαίος (Judith xiii. 9.) should, as Dr. Shaw figures (Travels in the Levant, p. 221), rather be called the gnat or misquito net, which is a close curtain of gauze or fine linen, suffed, all over the East, by people of better tattum to keep out the flies.

**CANORASAY**, in Geography, a small island of Scotland, near the north coast of the island of Coll.

**CANOSA**, a town of Italy, in the kingdom of Naples, and country of Bari, destroyed by an earthquake in 1694. It was once episcopal, but the see has been united to the archbishopric of Bari: 31 miles west of Bari. This town occupies part of the site of the ancient Canusium founded by Dionysius, and afterwards a Roman colony, which became one of the most considerable cities in this part of Italy for extent, population, and magnificent buildings. The area of Trajan seems to have been that of its greatest splendour; but it was thus marked as an object alluring to theavarice and fury of the barbarians. Genfrie, Tortola, and Authar-Viri treated it with extreme cruelty. The province to which it belonged was reduced to a deplorable state in 559. No town in Puglia suffered more than Canosa from the outrages of the Saracens; and the measure of its distress was much augmented by the contells between the Greeks and Normans. In 1192, it was aligned, by agreement, to Bohemund, prince of Antioch, who died here in 1191. Under the reign of Ferdinand III. this chief belonged to the Grimaldis; but on their forfeiture, the Alfedetti regained it, and still retain the title of Marquis, though the Capet are the proprietors of the fief. The ancient city stood in a plain between the hills and the river Ofanto, and covered a large tract of ground. Its ancient granary is still attested by many fragments of aqueducts, tombs, amphitheatres, baths, military columns, and two triumphal arches, which seem to have been two city gates. The present town stands above, on the foundation of the old citadel, and is a poor remnant of so great a city, not containing above 300 houses. The church of Sabins, built, as it is said, in the 6th century, has altars and pavements that are rich in marbles, and the fix Verde Antico columns that support its roof are the largest and finest, says Swinburne, which he ever saw of that species of marble. In a small adjoining court, under an octagonal cupola, is the mausoleum of Bohemund, adorned in a minute Gothic style. In 1461, the prince of Taranto, among other acts of barbarity practiced by him at Canosa, broke open this sepulchre, and disturbed the ashes of a hero, who, by his extraordinary military talents, rivalled the fame of his father Gnutcard, and by his victories hoiked the throne of the eastern emperors; and when he was deprived of his Italian inheritance, turned his arms against the Saracens, and formed a new sovereignty for himself in Palestrina. As prince of Antioch, he became one of the foremost captains of the Crusado against the infidels. Swinburne's Travels, vol. ii. p. 321.

**CANOSA,** in Itelhydogy, a name given by Salian, and some other authors to the species of *Shark,* called by modern writers *squalus galbus,* the tope of the Cornish fisherfolk.

**CANOSIA,** in Geography, a town of the province of Saluzzo; 15 miles S. W. of Saluzzo.

**CANOT Cabe,* lies on the salt lake of the island of St. Lucia, in the West Indies, towards the north end of the island. On its south side is a bay of the same name.

**CANOUGE.** See CANOGUE.

**CANOVIO,** a town of European Turkey, in the province of Aragon; 22 miles S. of Durazzo.

**CANOUL,** a town of Hinduooftan, and capital of a circuit, in the country of Hydabad; 95 miles S. W. of Hydabad, and 124 E. of Banderag. N. lat. 16° 10'. E. long. 78° 29.'

**CANSCHWORCE,** L. a town of France, in the department of the Loire, and chief place of a canton, in the district of Marqués. The town contains 2419, and the canton 6470 inhabitants; the territory includes 238 kilometres and 7 communes. It is a place of considerable trade in cattle and woollen stuffs.

**CANQUES,** in Commerce, a sort of cotton cloth made in China; with this cloth they make that first garment next their skin, which is properly their shirt.

**CANSRena,** in Conchology, a species of *Nerita,* that inhabits the Indian, African, and American seas, and of which there are nearly thirty varieties at present ascertainned. It is specifically distinguished by the shell, smooth, with a somewhat pointed spine, and bident, gibbous, umbilicus, Linn.—Obs. There is much reason to believe that some at least of those shells which Gmelin considers as varieties only of his *nerita canrenata,* may prove, on further examination, to be distinct species.

**CANSADO Cabe,* in Geography, is situated three leagues N.N.E. from Cape Blanco, on the coast of Africa.

**CANSCHI,** in Botany, (Rheed. Mal. i. tab. 42. Burm. Ind. 1298.) See *Trevia Napus.*

**CANSCHY,** a large tree in Japan, from which the inhabitants make their paper. See a particular account of the process from the Ephem. N. C. in the Coll. Acad. P. E. tom. iv. p. 144. It is not certainly known, whether it be the paper mulberry, *norus papyrifera,* Linn. *papyris,* Lam. *brassicaeuis,* L'Herit. and Ventenat.


**Gen. Char. Calyx globular-pitcher-shaped, four-toothed. Corolla tube. Stema filamenta four, inserted into the bottom of the calyx; anthers roundish, not extending beyond the calyx. Filiis semina superior, very small, enclosed by four scales; style one; stigma capitata. Peric. berry one-seeded. A shrub. Leaves alternate. Flowers with one bracte, in axillary spikes. Character formed from a dried specimen of Sonnerat's communicated by La March, except the fruit, which is taken from Rhede's figure.

**CANSO. CANOOS.** in Geography, an island, 6
cape, and small fishing-bank on the S.E. coast of Nova Scotia, about 40 leagues E. by N. from Halifax. The island is small, and near the continent, N.E. from Cape Canfo, which is the south-eastermost land of Nova Scotia. Canfo has a good harbour, about three leagues deep. Here are two bays of safe anchorage. Near these, on the continent, is a river, called Salmon river, on account of the great quantity of salmon taken and cured there. This is thought to be the infant fishery of that part of the world. Lime-foun and gypsum are found in the gulf of Canfo, which is a very narrow strait, forming the passage from the Atlantic into the gulf of St. Lawrence, between Cape Breton and Nova Scotia.

Canfo Port, of which the south point is Cape Canfo, is situated in N. lat. 45° 20' 7". W. long. 60° 35'.

Canfo is also a township near the above-named place, in the county of Halifax.

Canstadt, a town of Germany, in the circle of Swabia, and duchy of Wurttemberg, seated on the east bank of the Neckar. In the town is a manufacture of printed linens, and near it are medicinal springs. It is distant three miles N.E. from Stuttgart. N. lat. 48° 51'. E. long. 7° 36'.

Canstein, a town and citadel of Germany, in the circle of the Lower Rhine, and duchy of Westphalia; 6 miles S.E. of Stadsburg.

Canstrisius, an officer in the church of Constan- tinople, whose business is to take care of the patriarch's pontifical vestments, affit in robing him, and during mass to hold the incense-pot, and sprinkle holy water among the people, while the hymn of the Trinity is singing. The word is also written Canstrinus; it is usually derived from Canstrum, a name which some suppose given to the incense-pot, others to the kind of balsam in which the patriarch's vestments were kept. Du-Cange.

Canwa, a river in Geography, a river of Hindoostan, which runs into the sea, 40 miles S.S.W. of Junagur or Chumagur, in the country of Guzerat.

Cant, a quaint, affected manner of speaking, or writing, adapted chiefly to the lower sort. Cant is originally derived from Andrew Cant, a Camero- nian preacher in Scotland, who, by exercise, had obtained the facility of talking in the pulpits in such a tone and dialect as was understood by none but his own congregation; and hence the term is extended to denote all sudden exclamations, and whining tones, especially in praying and preaching. This origin of the word, however, has been disputed, and it has been derived from the Latin cantare, to sing. Others imagine that it is corrupted from quain, of Fr. caint, and Lat. compitus.

Cant, or Canning Language, is also applied to words and phrases affected by particular persons, or professions, for low ends, and not authorized by the established language. Cant is not restrained to the style of gypsies, thieves, and beggars, but poaches a large department in the politer pro- vinces of the English language. An anonymous author has given a canting dictionary, comprehending all the terms used in the several tribes of gypsies, beggars, shoplifters, highwaymen, foot-pads, and other classes of cheats and villains, with a collection of songs in the canting dialect. Lond. 1725, 8vo.

A writer in the Tatler, alligns divers sources of cant-words; as phizz, bippo, mobb, pozz, lamm, &c. Tat. No. 250.

The free language will melt of it come under the denomi- nation of cant; and the like holds of the terms in alchemy, heraldry, not to say in astrology, or even chemistry, pharmacy, &c. In reality the difference between a cant-term, and a technical term it is not easy to assign, unless we choose to refrain the former to words introduced out of folly, affection, or imposition; and the latter to such as are introduced for the sake of clearness, precision, and signifi- cance.

Cant is also used to denote a sale by auction.

The origin of the word, in this sense, is dubious; it may come, according to some, from quantum, how much; according to others, from cantare, to sing, or cry aloud; agreeably to which, we sometimes call it an out-cry.

Canting timber, in ship-building, are those timbers which are flattened near the two ends of a ship. They are so called because their planes are inclined to the middle vertical fe- culation of the ship lengthwise, or plane of elevation, in contradistinction to those whose planes are perpendicular thereto. And this canting, or inclination of any timber is such, that it may stand perpendicular, or nearly so, to that part of the ship's side where the timber is flattened.

Cant is also popularly used for an angle, or corner; and cantpieces are those that are used in the angles of the kites, and hide-trees; or to supply any part that may be fanny or rotten.

Cant, Agent, in Biography, affisted Ruysech, towards the end of his life, in making his anatomical preparations. He was afterwards a pupil to Albinus, and distinguished for his abilities, but died at a very early age. He left a well- furnished library, abounding particularly in works on anatomy. In 1721, he published "Impetus primiti anatomici ex liberis cadaveribus nati," fol. Leid. with six engraved plates representing the muscles of the face, the carotid artery, duum mater, the heart in situ, the stomach, and joint of the knee, in general correctly delineated. Haller Bib. Anat.

Canta, in Geography, a jurisdiction of South America, in the vice-royalty of Peru, and circuit of Lima. It begins at the distance of 5 leagues N.N.E. from Lima, where it terminates in the circado or circuit of that city. Its extent is above 30 leagues, most of which comprehend the first branch of the Cordillera of the Andes, so that the temperature varies in different parts of the country, and is thus beneficial to the fruits of the earth and pastures; and as every species may be appropriated to its suitable degree of heat, the produce is large and very good. The papa is particularly distinguished among the fruits, and the roots find a good market at Lima. The extensive fields of Bamboo, which partly belong to this jurisdiction, though cold from their high situation, afford pasture for innumerable flocks of sheep; they are divided into "Haciendas," or estates belonging to noble families of Lima.

Cantabile, an Ital. adj. implying music fit to be sung; a melody for the voice, not instrumental. A series of measured sounds, of which the cantilena is graceful or pathetic, is said to sing. To be able to play or sing an aria di cantabile, is the highest praise that can be bestowed on a musician. Execution surpasses, and for a certain time amuses; but goes no farther than the ear; but to sing a cantabile with tenderness and expression, is conveying sounds to the heart.

Cantabra, an Ancient Geography, a river of India, reckoned by Pliny among the most considerable which discharged themselves into the Indus.

Cantabri, a people of HISPANIA Citerior, or Hither Spain, or Province Tarraconensis; whose district was bounded on the north by the sea of their name, "Oceanus Cantabrum," now called the bay of Biscay; and extended from the country of the Almorin, on the west, to that of the Vaiconi, on the east. Pliny divides them into four nations, without distinctly naming them. The Cantabrians inhabited
a mountainous country, and were, in their disposition and habits, ferocious and warlike. The women were no less valiant than the men; and devoted themselves to similar employments. Strabo mentions several facts, evincing the facility with which the females delivered themselves of their children, without requiring any temporary confinement, or any intermission of their usual occupations. He also informs us, that they entered the several territories without betraying any concern, and chanted their laments even at the moment of their dying. It was with great difficulty that the Romans subdued this hardy and valiant people. They, as well as the Alturians (see Asturia), defended themselves for a considerable time with invincible firmness and resolution; availing themselves of the places of security and inaccessible retreat which their mountains afforded them. They were, however, at length overpowered, and constrained to submit to the arms of Augustus, about 25 years before Christ. Antiklius, Furinius, and Agrippa were employed in this service; and after having been driven from their towns, and pursued even to their rugged mountains, whilst the Roman fleet harassed their coasts, they were obliged to shelter in mount Medullius, and were so surrounded, that they had no possible means of making their escape. When this stubborn people found themselves thus encompassed, they preferred a voluntary death to surrender and captivity. Molt of them destroyed themselves by the sword, by fire, or by a poison extracted from the yew-tree, or from an herb resembling parsley, which they preferred as a resource against any reverse of fate, because it made them die without pain. Mothers smothered their children, to prevent their falling into the hands of the enemy; and among those who were taken, a young boy was observed, who, having found a sword, killed his brothers, and all his relations, by the order of his father. In like manner, a woman killed all that were prisoners with her. At last, when Augustus had succeeded in subduing them, he determined to soften their ferocity, by compelling them to abandon their mountains; having fold some of the prisoners, he required hostages from those that remained in the country, and fixed their abode in the plains. Inimical of a foreign yoke, they took advantage of the absence of Augustus; they again revolted, and attacked the Roman garrisons with their usual fury. Agrippa was therefore deputed to complete their reduction, but he found the enterprise extremely difficult, so that even the Roman soldiers under his command began to despair of ever accomplishing it. This brave commander, so much was his legions disheartened by the resistance and repulses with which they had to encounter, was under a necessity of recurring to intrigues and merce, and of punishing some of his soldiers with ignominy, before he could induce them to renew their engagement with this formidable enemy. But having at last prevailed upon them to meet the Barbarians in an open field, he so animated them by his example, that, after an obstinate conflict, he obtained a complete victory, and thus terminated this destructive war. Having put to death those who were able to bear arms, and destroyed their cattle and strongholds, and forced those who survived to quit their mountains, and to settle in the plain, he subdued them so effectually, that they never attempted to revolt again, but quietly submitted to the Roman yoke. Strabo, lib. iii. Sueton, in August. The celebrity of the valorous Cantabrians was formerly so great, that most of the provinces of Spain laid claim to the honour of having been comprehended within the limits of ancient Cantabria. Louis XV. created or formed a regiment of this name, the 13th December 1745, which, by an ordinance of the 11th of July 1747, was called Royal Cantabre. Silius Italicus, in his enumeration of the different tribes, people, or nations, whom Hannibal carried with him into Italy, makes the Cantabrians march before all the rest. And Pompey regarded the Cantabrians, and some of the neighbouring people, as the best troops in his army. CANTABRIA, the name of a country on the northern coast of Spain, called by the inhabitants Visca, and by others Bilbao, and comprizing the provinces of Biscay, Alava, and Guipuscoa. See the preceding article. Strabo says, (lib. iii. vol. i. p. 237.) that, according to the report of some writers, the Lacedæmonians had once possessed part of this country, and built in it a city called “Optirellis.” The Goths having invaded Spain, in the 7th century, Lenuigild refuted to subdue that part of it which remained steady attached to the Romans, and turning his arms against the Cantabrians, took and destroyed the city of Cantabria, situated between Logronno and Viana, and the city of Amaya. But there he terminated his career; afraid to run the risk of penetrating farther among the mountains and desiles inhabited by those people, who, in spite of him, continued faithful to the Romans, though they were entirely expelled from Spain.

CANTABRIAN, the ancient language of the northwestern part of Spain, in use before the country was subdued by the Romans. Dr. Wallis seems to make the Cantabrian the ancient language of all Spain: which, according to him, like the Gaulish, gave way to a kind of broken Latin called romanes or romangae: which by degrees was refined into the Celtiberian or preface Spanish. But we can hardly suppose, that so large a country, inhabited by such a variety of people, spoke all the same language. The ancient Cantabrian, in effect, is still found to subsist in the more barren and mountainous parts of the province of Biscay, Alusias, and Naverre, as far as Bayonne, as much as the British do in Wales; but the people only talk it: for writing, they use either the Spanish or French, as they happen to live under the one or the other nation. Some attribute this to a jealousy of foreigners learning the mysteries of their language; others to a poverty of words and expressions. The Cantabrian does not appear to have any affinity with any other known language, abating that some Spanish words have been adopted in it for things whose use the Biscayans were anciently acquainted with. Its pronunciation is not disagreeable.

The Lord's prayer, in the Cantabrian tongue, runs thus: Gure aicro cervean aetnca. fanstica betho bicaicn, otho bethi refana, eguan betho bicoatudrian cerno bekta lrunarron, &c.

CANTABRICA, in Botany (Cl. Hist. 2.49.). See Convolvulus Cantabrica.

CANTABRUM, in Antiquity. Under the Roman emperors, succeeding Constantine, this was a kind of banner, ensign, or standard, differing in this respect from the vexillum, that the latter of these was a large flag, distinguished by its colour, and by a device on it; whereas the former, or cantabrum, was only a small standard and flag, which had also a particular colour, and served for rallying and encouraging the soldiery. For this purpose it is said to have borne on it some words or motto of good omen. Minucius Felix and Tertullian mention it in their apologies, and compare it to a crois.

CANTACUZENUS, JOHANNES, in Biography, emperor of Constatinople and a learned historian, was born of an ancient and noble family at Constantinople, about the year 1205; and having been bred both to literature and to arms, he attained the highest offices of the state, such as preste of the bedchamber under Andronicus the Elder, and the
the dignity of domesic under Andronicus the Younger. Attaching himself to the interest of Andronicus the Younger, in opposition to that of his grandfather Andronicus the Elder, who abdicated the government A.D. 1328, and having contributed to rescue him from the power of his grandfather, he brought him back in triumph to the palace of Constantinople, after six years of civil war. Under his reign Cantacuzene ruled both the emperor and the empire; and it was by his valor and conduct that the isle of Lesbos and the principality of Autria were restored to their ancient allegiance. Although he enjoyed many favourable opportunities for enriching himself by oppression and rapine, his enemies confess that, among the public robbers of the empire, Cantacuzene alone was moderate and abstemious. Nevertheless, his wealth, probably devolved upon him by inheritance, appears from his own account of it to have been prodigious; more especially when we consider that it was partly accumulated in the last period of the empire, and in a land, most probably in Thrace, so repeatedly waited by foreign and domestic hostility. He does not indeed specify the value of his money, plate, and jewels; yet, after several very considerable deductions, his forfeited treasures were sufficient for the equipment of a fleet of 90 galleys. He does not give us either the extent or number of his estates; but his granaries were filled with an incredible store of wheat and barley; and the labour of a thousand yoke of oxen might cultivate, according to the practice of antiquity, about 35,520 acres of arable land. His pastures were stocked with 2500 broad mares, 200 camels, 300 mules, 700 assrs, 5000 horned cattle, 50,000 hogs, and 70,000 sheep. Thus distinguished by rural opulence, he enjoyed, in a very high degree, the favour of his sovereign; and though he declined accepting the honour that was offered him of being his associate in the sovereignty, he was named in the last testament of Andronicus the Younger the guardian of his son John Paleologus, who succeeded his father in the ninth year of his age, A.D. 1341, and the regent of the empire during his minority. This trust he discharged with fidelity, till a regard to his own safety rendered it necessary for him to adopt measures of self-defence. A combination, however, was formed against his regency by the dowager empress, Anne of Savoy, the great duke or admiral Apocaurus, and John of Apri, patriarch of Constantinople. By this powerful confederacy Cantacuzene was assailed at first with clandestine and at length with open arms. During his absence on the public service he was accused of treason; proscribed as an enemy of the church and state; and delivered, with all his adherents, to the frown of justice, the vengeance of the people, and the power of the devil. His fortunes were confiscated, his aged mother was cast into prison, all his past services were buried in oblivion, and he was driven by injustice to perpetrate the crime of which he was accused. As long as the empress and the patriarch affected the appearances of harmony, he repeatedly solicited the permission of retiring to a private, and even a monastic, life; and after he had been declared a public enemy, it was his fervor with to throw himself at the feet of the young emperor, and to receive without a murmur the froward of the executioner. At length he reluctantly adopted the only measure that was likely to avail to his security, which was that of drawing the sword and assuming the imperial title. Accordingly in the strong city of Demotica, his peculiar domain, he assumed the purple, A.D. 1341; maintaining, even in this act of revolt, some shew of loyalty, by cauing to be proclaimed the titles of John Palæologus and Anne of Savoy before his own name and that of his wife Irene. Conflantinople adhered to the young emperor, and the principal cities of Thrace and Macedonia returned their allegiance to Constantinople. His army, which was stationed on the bank of the Menes, for the purpose of intercepting or interfering the capital, was dispersed by treachery or force, and the empress accepted the terms, and embraced the former of the Byzantine court. Cantacuzene, driven by Apocaurus, left the city into the mountains of Serbia, his truly band of followers was diminished to 2,500, and at last to 1,000 men. The "Crab," as depop of the Serbs, regarded him with hostility; but in a state of miserable dependence, he never declined assistance, and was at length defeated without reply, to a new multitude of hopes and fears. A civil war commenced, which, after having raged for many years, terminated in a decisive victory on the part of Cantacuzene, who re-entered Constantinople A.D. 1347. The indefatigable Anne, declared the powers of rebellion, or the hope of relief, was at length compelled to yield to the applications of her friends and enemies; and a treaty was dictated by the emperor, who professed a loyal and zealous attachment to the son of his benefactor. The marriage of his daughter Helen with John Palæologus, to whom he had been for some time engaged, was at length consummated; the hereditary right of the pupil was acknowledged; but the sole administration, during ten years, was vested in the guardian. Thus two emperors and three empresses were seated on the throne; a general amnesty was proclaimed; and the festival of the coronation and nuptials was celebrated with fallacious appearances both of concord and magnificence. The tranquillity of Cantacuzene and of the empire was, however, soon disturbed by suspicions and enmities between the two emperors and their respective adherents, which at length broke out in a civil war, A.D. 1353. Cantacuzene, aided by the Turks, was successful, and the young emperor was compelled to take shelter among the Latins of the isle of Tenedos. The victor, provoked by his insolvency and obstinacy, was induced to associate with himself his son Matthew, whom he invested with the purple, and thus he established the succession in the family of the Cantacuzenes. Palæologus, however, afield by the Genoese, who, by a treaty subscribed by Cantacuzene, A.D. 1352, which formerly banished the Venetians and Catalans, obtained a monopoly of trade, and almost a right of dominion, regained Constantinople, A.D. 1355; and Cantacuzene abdicated his share of the government, and retired to a monastery, where, under the assumed name of Joseph and the habit of a monk, he devoted the residue of his life to literary and theological exercises. His wife Irene also retired to a nunnery, and exchanged her own name for that of Eugenia. If, indeed, he issued from this retreat, it was as the minister of peace, to facilitate the obstinacy and solicit the pardon of his rebellions son. In the retirement of a cloister his active spirit prompted him to engage in a controversy against the Jews and the Mahometans, and he composed four apologies for the Christian religion and four discourses or books, (printed in Greek and Latin at Basle, in 1543, by Bible and Gualtherus, from Greek MSS.,) at the particular request of a prolepte to Christinon, Aechmenides, called also Meteiri, who was assaulted with letters from his friends at Ipahan. Maracci informs us, that, though he had read the Koran, he adopts the vulgar prejudices and fables against Mahomet and his religion. He also, with equal zeal, defended the divine light of mount Thabor; and under the character of emperor and theologian, he professed in the synod of the Greek church, which established, as an article of faith, this uncreated light. See the article Barlaam. In his retirement he also wrote a history of his own times in four books, or at least of those times during which
he was a principal actor, comprehending a period that extends from the revolt of the younger Andronicus, A.D. 1320, to his own abdication of the empire, A.D. 1355, and continued one year beyond the abdication of his son Matthew, A.D. 1357. "In this eloquent work," says Gibbon, "we should vainly seek the sincerity of an hero or a penitent. Retired in a cloister from the vices and passions of the world, he presents not a confession, but an apology, of the life of an ambitious rascalman. Instead of unfolding the true counsels and characters of men, he displays the smooth and spacious surface of events, highly varnished with his own praisés and those of his friends. Their motives are always pure; their ends always legitimate; they confine and rebel without any views of interest; and the violence which they inflict or suffer is celebrated as the spontaneous effect of reason and virtue." Voltaire, however, without hesitation, prefers him to all the Byzantine historians. A Latin translation of this history, from the Greek MS. in the library of the duke of Bavaria, with notes, was published by Pontanus at Ingolstadt in 1633, fol.; and at Paris in 1645, in a splendid edition consisting of 3 volumes, fol. of the Greek from the MS. of M. Seguier, chancellor of France, with Pontanus's Latin versions, and the notes both of Pontanus and Greuter. Some other treatises by Cantacuzene, who assumed the name of Chirilodocus the monk, are extant in MS. in the Vatican, Parisian, Cevenal, and Bodelian libraries. The death of Cantacuzene is placed by respectable authority on the 20th of November 1411. (Du Cange, Fam. Byzant. p. 260.) But if he were of the age of his companion Andronicus the Younger, he must have lived 116 years; a rare instance of longevity, which, in so illiberal a person, would have attracted universal notice. Fahr. Bib. Græc. t. vi. l. v. c. 5. § 12. p. 409; &c. Gibbon's History, &c. vol. vi.

CANTADUANES, in Geography. See CANTADUANES.

CANTE, in Ancient Geography, a people of Britain in that part called Caledonia, who, according to Ptolemy, were feated towards the eastern coast on the north side of the frith of Tayne. Mr. Baxter places them in Breben, which he derives from the Britih words "Pow Chant," signifying, as he says, the country of the Cante.

CANTAL, in Geography, a large and lofty mountain of France, which is said to be 993 toises higher than the level of the sea, and always covered with snow. It is situated in the centre of a department to which it gives name, and which is one of the three formed out of Auvergne and le Velay. This department is bounded on the north by the departments of Upper Loire, Puy de Dôme, and Corrèze; on the east by those of Upper Loire and Lozère; on the south by those of Lozère, Aveyron, and Lot; and on the west by those of Lot and Corrèze. Its superficies is about 3,124,802 acres, or 574,487 hectares; its population consists of about 243,708 persons; and it is divided into four communal districts, viz. Mauriac, Murat, St. Flour, and Aurillac.

CANTALIVER, in Architecture. This term is used by workmen to denote those blocks which are frequently placed, at regular distances, under the eaves of a house, or the upper mouldings of a cornice, which they serve to support or ornament. Cantaliver, therefore, is essentially the same with modillion; but the latter word is confined to the description of regular architecture, while the former has a general and trivial use.

CANTANUS, in Ancient Geography, a town placed by Steph. Byz. in the island of Crete. It was an episcopal seat, and mentioned in the acts of the council of Chalcedon.

CANTAR, or CANTARO, in Commerce, an eastern weight, of different value in different places, equivalent at Acre in Turkey to 603 pounds, at Tunis and Tripoli to 114 pounds.

CANTAR is also an Egyptian weight, which is denominated a quintal, and consists of a hundred, or of an hundred and fifty ratsus, according to the goods they are to weigh.

CANTARA, in Geography, a river of Sicily, anciently called "Taurumius," which runs into the sea; five miles from Agolla.

CANTARE, Ital. to sing. Singing is a faculty that requires the union of so many gifts of nature, and so much adherence from art, that the complete concurrence and union of both rarely happen. The requisites from nature are a voice full, flexible and extensive in compass, well-toned, clear, and interesting; with an ear perfectly correct in time and tune. The acquisitions from art are a good partimento, or delivery of the voice from the chest, free from nasal or guttural defects, a good thake, good taste and expression, with a rapid, distinct, neat, and articulate execution of divisions, and the power of sustaining a long note with readiness, and of augmenting and diminishing its force by the most minute degrees.

The individual in possession of all these requisites, will be regarded as a prodigy! and with health, diligence, and good conduct, may be pronounced heir to a great estate, arising from means the most flattering to self-love, and grateful to a good heart: the power of innocently delighting mankind.

These qualifications the critical and fadidious hearer thinks his due—be it so: but in order to balance the account between the performer and his audience, let us remind the latter of the fair and just claims which every performer possessed of great talents has on the public, but in a particular manner, a finger, who having arrived at thee captivating powers by uneasing study, toil, and experience, is not only entitled to confident remuneration, but to regard and attention from the public, for its own sake: for if by neglect, snore, and mortification, a vocal performer's mind is disquieted, and chert agitated, that ardent desire to please those who seem disposed to be pleased, and those efforts which encouragement alone can illuminate, are chilled and paralyzed, to the great loss of the feeling part of an audience, and disgrace of the humbled performer. From such treatment what can be expected but a cold, inanimate, and lifeless performance, without professional zeal, or the enthusiasm of genius and talents.

Garrick used to say, that applause was an aliment without which he could not live on the stage; and inattention to the part he was representing, he never forgave. He complained to an officer on guard, of a centinel yawning aloof on the stage during his acting one of his best parts; and he never relit till Pinto the first violin, and leader of the band, had quitted his station, after perceiving him fall asleep in the orchestra, in flight of the whole house, while he was acting one of the most imprefve and afflicting scenes in King Lear.

Singing has long been cultivated and cherished in Italy. In the Cortegiano of Castiglione, written at the beginning of the 15th century, we are told of two fingers, whose merit in a totally different style of singing was so equal and so great, that they charmed all hearers. These performers are mentioned to prove, that in all the arts there are various roads that lead to perfection, and different means of delighting mankind. Bidon says the author of that pleasing work, has such force, readiness, and variety of passages, that the souls of all hearers are so excited, inflamed, and ravished, that they seem transported above themselves, and almost
exalted into heaven. Nor does Marchetto Cara less excite the affections by a more tender and touching style, which commiserates and fothers the affections of others, or with sweet, complaining, heart-felt notes, softens, instructs, and penetrates the mind, for sorrow not their own. Toño applies to Fanciulla and Cuzzoni, the two great vocal rivals of his time, those captivating powers by difficult talents.

And we may, perhaps, with equal accuracy and candour affirm, that Such are at present, (1802) the excellencies of the Billington and the Bainti, whom however the one to the other, only proves that the taste of hearers is as various as the style of singing of great performers.

Since the establishment of operas, no professional talents in any of the fine arts have been more celebrated than those of great Italian fingers; who being invited to different states and kingdoms, have an opportunity of extending their fame to every part of Europe; and their talents are as well known at Vienna, Madrid, Peterburgh, Dresden, Berlin, Munich, and London, as in their own country.

We cannot pretend to render this article a complete elementary treatise on singing, and, indeed, as Johnson truly said of books of instruction, "nothing is well made by a receipt!" yet, to trace, and specify a few of the first principles of the art, may be of some use to vocal students out of the reach of better instructions.

For those who seek vocal precepts in books, we recommend the perusal of Toño and Mancini; and as a specimen of the art, we shall present our readers with Tenducci's first injunctions to his scholars. For fagio, or exercises for the voice, those of Leo, on which so many great singers have been formed, are now only useful to the performers of old music; but new melody requires new fagio, to prepare a finger for divotions and graces of the present times. For such, the most modern, and perhaps the best, are those of Apriile, which, however, are now full 30 years old; but many modern melodies have been since produced in the vocal compositions of Paciello, Cimarosa, Sarti, Haydn, and Mozart, as well as refinements in the performance of Paccieretti and Marchefi, with which young scholars should be made acquainted.

The Cyclopaedia, being intended to assist those who study an art or science without a master, we shall present the solitary student in singing with the following instructions drawn up in Italian, as we imagined by the late Signor Tenducci, who brought them to the author of the present article to revise and translate; but on comparing them with the preliminary rules placed at the head of the English edition of Apriile's Modern Italian Method of Singing, under the title of Necessary Rules for Students and Dilettanti of Vocal Music; it appears that the Italian copy of the instructions, brought by Tenducci to be translated, belonged to Apriile, and that the English translation of these rules is literally that with which Tenducci was furnished by himself.

Necessary rules for students and dilettanti of vocal music.

I. The first and most necessary rule in singing, is to keep the voice steady.

II. To form the voice in as pleasing a tone, as is in the power of the scholar.

III. To be exactly in tune; as without a perfect intonation, it is needless to attempt singing.

IV. To vocalize correctly; that is, give as open and clear a sound to the vowels, as the nature of the language, in which the fluent flings, will allow.

V. To articulate perfectly each syllable.

VI. To sing the scale, or gamut frequently; allowing to each found one breve or two semibreves, which must be sung in the same breath; and this must be done, in both, a mezza di voce: that is, by swelling the voice, beginning pianissimo, and increasing gradually to forte, in the first part of the time; and to diminishing gradually to the end of each note, which will be expressed in this way.

Pianissimo --- crescendo (forte) --- diminuendo Piano.

VII. To exercise the voice in sol-fagio every day, with the monosyllables, de, re, mi &c.

VIII. To copy a little music every day, in order to accustom the eye to divide the time into all its proportions.

IX. Never to force the voice, in order to extend its compass in the voce di petto, upwards; but rather cultivate the voce di testa, in which is called solfette. In order to join it well, and imperceptibly, to the voce di petto, for fear of incurring the disagreeable habit of singing in the throat, or through the nose:—unpardonable faults in a finger.

X. In the exercise of singing, never to discover any pain or difficulty, by distortion of the mouth, or grimace of any kind; which will be best avoided by examining the counterpoint in a looking-glass, during the most difficult passages.

XI. It is recommended to sing a little at a time, and often, and if standing, so much the better for the chell.

XII. That scholars should appear at the harpsichord, and to their friends, with a calm and cheerful countenance.

XIII. To rest or take breath between the passages, and in proper time; that is to say, to take it only when the periods, or members of the melody, are ended; which periods, or portions of the air, generally terminate on the accented parts of a bar. And this rule is the more necessary, as by dwelling too long upon the last note of a musical period, the finger loses the opportunity it affords of taking breath, without breaking the passages or even being perceived by the audience.

XIV. That, without the most urgent necessity, of either a long passage, or of an affecting expression, the words must never be broken, or divided.

XV. That a good mezza di voce, or swell of the voice, must always precede the ad libitum pausa — and Cadenza.

XVI. That in pronouncing the words, care must be taken to accord with the sentiment that was intended by the poet.

XVII. That the acute and super-acute sounds must never be forced as to render them similar to shrills.

XVIII. That in singing, the tones of the voice must be united, except in the case of staccato notes.

XIX. That in pronouncing the words, double consonants in the Italian language, must be particularly enforced, and care taken not to make those that are single seem double.

XX. To pronounce the flaccitia with the greatest care and attention, which must generally commence with the highest of the two notes, and diminish with the lowest.

XXI. That the ornaments and embellishments of songs should be derived from the character of the air, and passion of the words.

As Apriile was the real author of these precepts, to whom we did not allow an article when we were at work upon the letter
CANTATA, the title of a short lyric poem, consisting of alternate recitation and air. The word Cantata, according to Du Cange, was used in the church as early as the year 1314, to express what we at present mean by anthem, with which it still synonymous in Germany: being chieflv confined in the Lutheran church to sacred music. The Roman church had many admirable sacred cantatas during the last century, by Carissimi, Graziani, Bodini, and others. And during the present century, Domenico Scarlatti set one at Rome for Christmas Eve, which was performed in the apotolic palace, 1717. Bononcini set another, 1729, for the same occasion and place. The difference at present between sacred cantata and moteti seems to be the recitative.

The secular cantata is a species of composition extremely well suited to the chamber, in which fewer parts, fewer great effects, and less light and shade, are necessary, than in ecclesiastic or dramatic Music; for the performance being in daily life, and the poet and musician without an orchestra or choir to assist in painting the stronger passions, composers aimed, for a long time, at no effects out of the power of a single voice and a single instrument to produce.

Cantatas of considerable length, accompanied by a numerous band, are usually performed in Italy on great occasions of festivity: as the reconciliation of princes after long division, or the arrival of great personages in the capital of a state. Thus, when pope Ganganelli and the king of Portugal were reconciled, in 1750; and soon after, when the Emperor Joseph arrived at Venice, on his first visiting Italy, cantatas were sung at Rome and Venice equal in length to an opera. But these differ essentially from what is usually meant by a cantata or monologue for a single voice, consisting of short recitatives, and two or three airs at most; as they are occasional poems in which several singers are employed; but though in dialogue, they are performed, like oratorios, without change of scene, or action.

As cantatas were first suggested by the musical recitation of the opera in which the chief events were related in recitative; in like manner they received several progressive changes during the 17th century, previous to their perfection. First, they consisted, like opera scener, of little more than recitative; with frequent formal clozes, at which the finger, either accompanied by himself or another performer on a single instrument, was left at liberty to swell his tale and talents.

The next change was in having a single air, generally in triple time, distinct from the recitative, and repeated to different stanzas after each narrative part of the poem, like modern ballad airs. At this time the term da capo not being in use, the air was written over again, as often as it was wanted, sometimes in exactly the same notes, but more frequently, with little changes and embellishments to the same base, and to different stanzas.

Before the invention of recitative, madrigals for voices alone, and afterwards for instruments in unison with the several vocal parts, constituted the chief music that was performed in the chamber, and in private concerts, till folongs, accompanied by a single instrument, were brought into favour by Caccini and his imitators, in Italy and other parts of Europe. See CACCINI.

Adami tells us, page 154, that Giovanni Domenico Piaiachez Romano, admitted into the Pope's chapel 1612, composed several cantatas in a good stile, and in the bel taille of singing, which were printed 1615; and page 195, that the Cavaliere Loredan Vittorio da Spoleto, soprano in the pope's chapel 1632, and one of the first evrati employed in musical dramas on the stage, was a celebrated composer of AIRS, E CANTATA DA Camera.
The first time, however, that we have found the term Cantata, used for a short narrative lyric poem, was in the Madrigale sacro a voce sola del Signor Benedetto Ferrari da Reggio, printed at Venice 1638; which is twenty years more early than the period at which the invention of cantatas is fixed by other writers, who have given the honour to Barbara Strozzi, a Venetian lady, who, in 1653, published vocal compositions, under the title of Cantate, Ariette et Dinti. Ferrari, detto della torre, for his excellent performance on that instrument, was one of the earliest composers of operas for Venice. Of the two full musical dramas that were performed in that city, 1657 and 1658, Ferrari was the poet; but in 1659, he was author both of the words and music of the opera Armida, as he was of several subsequent musical dramas.

Carissimi, Cesti, Longi Rolli, Stradella Lygenzii, Baffani, Alessandro Scarlatti, Gasparini, d'Adlorga, Marcello, Bononcini, Porpora, and Handel, all cultivated cantatas, and added something to the beauty of their construction.

The golden age of Cantatas, in Italy, was the beginning of the 17th century, when they were brought to their greatest degree of perfection, without other accompaniment than a basset viol, and harpsichord, by the genius and abilities of Alessandro Scarlatti, Francesco Gasparini, Giovanni Bononcini, Antonio Lotti, the Baron d'Adlorga, and Benedetto Marcello; and, at a later period in a more elaborate style, with accompaniments, by Nicolo Porpora, and Giovanni Battista Pergolesi, who seem to have been the last eminent composers that cultivated this species of chamber drama, till it was revived by Sarti.

The most voluminous and most original composer of cantatas that has ever existed, in any country to which our inquiries have reached, seems to have been Alessandro Scarlatti. Indeed, this master's genius was truly creative; and we find part of his property among the stolen goods of all the best composers of the first forty or fifty years of the last century.

Pergolesi's cantatas will be considered with his other works, elsewhere.

The French followed the Italian fashion in their rage for cantatas. Their great lyric poet, Baptiste Roufeau, and others, wrote a great number, which were set à la Lutte, and fùg à la François; but having never been heard out of France, nor could the music now be found, we believe, in it, we shall be excused, if we refrain from disturbing the ashes of the dead. There is an excellent critique on Cantatas, particularly those of his own countrymen, by M. Gingucq, in the new Encyclopædia, in which he has treated the subject with much judgment and good taste.

In England, cantatas were published early in the last century, by Handel, Bononcini, Attilio Ariosti, Gasparini, Rolingrave, and Dr. Pepusch; as difficult to find now, perhaps, as those of Clerambart, Montechair, Campora, Monver, and Batillin, in France.

But Cantatas, which were composed with more care, and sung with more taste and science than any other species of vocal music, during the latter end of the 17th century and beginning of the 18th, seem to have been wholly laid aside, after the decease of Pergolesi, till revived by Sarti, who has set, in the manner of cantatas, several of Metastasio's charming little poems, which he calls canzone.

These exquisite compositions were produced by Sarti expressly for the voices of Pacchierotti, Marchesi, and Rubini, and are, in all respects, the most perfect and complete models of chamber music that have ever come to our knowledge.

Indeed, it is to be lamented that a species of composition so admirably calculated for concerts in the cantata, should now be so seldom cultivated; as it contains a college drama entire, having a beginning, a middle, and an end, in which the charms of poetry are united with those of music, and the mood is animated while the ear is gratified. Opera fumas, or single songs, now supply the place of cantatas in all private concerts; but, besides the lady where these songs are taken out of their niche, as they were originally calculated for a numerous orchestra, they can seldom be completely accompanied by a small band.

Cantatilles, French, the diminutive of Cantata. It seems to be equivalent to Canzonetti in Italian, when a few lines of recitative precede a short air.

Cantata Prices, in Middle Age Writings, hired weepers, and wavers at funerals.

Cantay, A small island of the East Indian Ocean, Situate in a gulf formed by the west point of the island of Java.

Cantecroix, A town of Brabant, in a small territory of the same name; 5 miles N.E. from Antwerp.

Canteen, in French Cantine, in the cabaret, tavern, or place in a garrison-town or city, where the garrisons or troops have the privilege of purchasing spirits, wine, and beer at a much cheaper rate than they can buy them at other taverns or public houses. For the most part every citadel, fort, fortress, and castle, has the droit de cantine.

Cantina for Tobacco, in French Cantine du Tabac, by an ordinance of the 30th July, 1722, the king of France established a sufficient number of such cantines for furnishing his troops with the tobacco necessary for their consumption.

Cantina-maker, or Canten keeper, in French Cantiniere, is the person who has charge of the canten, dispenses things in it, and makes the proper, necessary, and authorized distributions in it.

Cantone, a small vessel usually made of tinned plate or wood, in which soldiers, when on their march, or in the field, carry their liquor. The use of wooden cantoes has for some time been general in the British armies. They are made cylindrical, like barrels, 7½ inches diameter, and 4 inches long outside, holding three pints. (See Manufacture of Canteens, Plate I., fig. 1.) Mr. George Smart, a very ingenious mechanic of Ordnance Wharf, Westminster-bridge, who manufactures them in great numbers for government, having adopted and contrived a very complete set of machines for abrading of labour therein, has liberally permitted us to describe and make drawings of this manufacture, which will, we trust, be acceptable to our readers. The wood which Mr. Smart uses, is the belt wainscot, or foreign oak, which is fawed out into boards 3 of an inch thick; these, after being planed, are cut in the direction of the grain, into slips ½ inches broad, and the whole length of the board, by a circular saw called a ripping-saw, similar to that in fig. 2, except that the groove, G, and slider, H 1, are omitted; A is the circular, or wheel-saw, made of steel plate, with fine teeth; on the end of its axis is a pulley, B, turned by a band going round it, and round a large drum under the bench, CC, driven by a horse-wheel. In fig. 3, is shewn the manner of fixing the saw, A, to its spindle, between two pieces of metal, C and D; one of which, C, is part of the spindle, and the other, D, is a moveable one, pushed towards the saw by a nut, E, working on a screw, at the end of the spindle; the plane of the saw in the ripping machine is not fixed exactly at right angles to the bench, CC, but at the proper angle for the fawes of the canteen, which are cut from these slips, when put together to form a cylinder of the true fize. The truth with which these faws cut, being fo great, that the edges
edges do not want planing. D, fig. 2, is the guide for the edge of the board as it is cut, which, for cutting slips of different widths, can be moved nearer to, or farther from the saw, by loosening the thumb-nut, E, the screw from which moves in an opening, F, in the bench, CC, and it is always kept parallel to the plane of the saw, by two equal levers, L, L. A workman takes one of the boards, and puts its edge against the guide, D; when he puts it forward, the saw, A, cuts it along into slips very quick; these slips are delivered to another workman, who uses a saw, called a cross-cutting saw, represented in fig. 2, the guide and saw of which have been described; G, is a grove cut in the bench to receive a slider, H, across one end of which another piece, l, is fixed, having a notch, J, in the underside for the saw to pass through, when it is slid forwards; the end of the slip, K, which is to be cross-cut, is pushed up close to the guide, D, and the piece, l, and slide, H, are pushed towards the saw which cuts it off instantly; the slide is then drawn back, and the slip, K, pushed up to the guide, D, for another length as before. The pieces, which are 4½ inches long, and 1½ inch broad, are for the flames of the canteen. The flames, b, fig. 1, and fig. 6, which have a hole in them for the cork or bung, are first cut out by the flame means as the common flames, but of twice the thickness; the piece, a, b, c, fig. 6, of this is cut out at once, by a machine called a tenoning or rebating machine, shown in fig. 4. A is a bench, in the middle of which is fixed a frame, carrying two circular saws, set at the proper angle to each other, to cut out the piece; D, is an inclined bed, with a groove, G, and slider, H and I, (as before described in fig. 2,) at the bottom of this bed, is fixed a piece of thick iron plate, E, acting as a guide to the saw while it is cutting: near the middle of this bed is the saw, e, the plane of which is parallel to the bed, D: a little farther on the bed is the saw, f, with its axis nearly horizontal; that end of its spindle which carries the saw, is supported by a crooked iron, g, fastened down to the frame by screws, so as to be capable of adjustment; the pulleys, f and g, on the spindles of the saws, are very near to each other, so that the fame band turns them both; it first passes round a large drum, driven by a horse-wheel, under the floor, then comes over a pulley, b, to change its direction; it next passes over the pulley, g, and then f, turning the two saws, (as represented separately in fig. 5,) it afterwards passes over the two pulleys, k and h, to change its direction to the drum again: the piece of wood which receives the saw, l, can be slid in and out of the tube, m, and fixed at any place by a pin, to tighten the band as it stretches: the piece of wood intended for the saw is laid against the croos, I, of the slider, H, and held tight while it is pushed forwards; the saw, e, cuts the plane, a, fig. 6, and as the flame advances, the plane, k, c, is cut by the saw, d, fig. 4. The hole, d, in these flames, for the corks, are bored by the machine represented in fig. 7. A, is a spindle with a pulley, B, on it, turned by a band, going quite round it, and a drum (with a velocity of 1800 revolutions per minute); at the end, a, of this is a male screw to fasten on the common borer, or centre-bit, fig. 8. D and E, fig. 7, are two smooth wooden rails, for a slider, g, to move upon, in the middle of which is fastened a small piece of wood, a, having a hole through it at b, and a shoulder at d; the workman takes one of the flames out of the box, G, and, putting one of its ends against the shoulder, d, of the slider, g, and one of its edges against the bottom board, holds it fast, while he pushes it forward against the borer. When it is necessary to use a different fixed borer, the slides, D and E, and frame, H H H, which holds them, can be raised or lowered, and fixed by two screws, i, j. The common and bung flames thus prepared, are given to a workman who uses tools represented by figs. 10, 11, and 12, Canteen. Plate II. fig. 10, is a thick block of wood, in which is turned a circular groove, a, a, an inch deep, and ½ of an inch wide; it is for fitting the flames in; when the groove is filled with the flames, the workman takes a screw-hoop. fig. 11, which is a thin plate of steel, with a square lump at one end, and another near the other end, to receive a screw, c, to tighten it; the workman puts this hoop over the flames, as seen in fig. 13, and turns the screw, c, until the flames are brought close enough, to drive on the iron truncheon, fig. 12. These cylinders, or canteens, are taken to a workman, who turns them in a lathe, fig. 14, where A is the pulley on the mandril, turned by a band from a large wheel, worked by a man; B is a conical chuck, on the end of the mandril, on which a canteen is driven by a mallet; the lathe is then set to work, and the ends of the flames or chime turned smooth by a tool laid in the notch, a, of the reel, C; another tool like a hook is then used, for cutting the groove on the inside of the flames, for receiving the head. The boards for the heads are first fawn out, as before described, into squares 7½ inches each side, these are cut circular by a lathe, fig. 15: the mandril has a wooden chuck on one end, with four steel points in it; a workman takes one of the square boards, G, and puts it up against the points in the chuck, and to confine it while it is turning, he uses a piece of wood, D, one end, d, of which is placed against the middle of the board, and the other has a small hole in it to receive the point of a screw, F, working in the puppet, E; the lathe is then turned, and the board cut to the proper diameter, by a chisel laid in the notch in the reel, C. The next operation is heading and hooping the canteens, which is done by knocking off one of the true hoops, and putting one of the heads into the groove; the flames are then tightened by the screw hoop, fig. 11, so that the hoop of the canteen may be driven on; the other head is then put in, and the hoop on, in the same manner; and the wires, a, and another not seen, fig. 1, are put in; they are for receiving the belt by which the canteen is carried by the folder. They are, finally, proved, by pouring a small quantity of hot water into them, and filling the cork-hole with a wooden flopper, when they are soaked, and the hot water rarefying the air within, the same will rush out violently, and discover any small leak that it may have. The slips of iron plate for the hoops are cut from large plates of sheet-iron, by the shears, fig. 16. A is the centre of a strong wooden lever eight feet long, which has a steel blade, a, a, two feet long, fixed by three screws to the under side of it; D is a strong bed fixed separately in fig. 17, on the top of which the other blade, b, b, is fixed, by three hooks, c, c, the upright legs of which go through the bed, and are fixed by three nuts; between the back of the blade and these hooks, three wedges, d, d, are put in; by drawing which the blade can always be brought near enough to the other blade, c, a, to cut; C C, are two guides to steady the lever, B; near one end of the blade a piece of iron, c, is fixed on the lever, B, which acts as a stop to the edge of the plate, E, as it is cut; f is another stop for the fame purpose, which slides through a hole in the bed, and is pushed up by a spring, g, under the bed. The plate of iron, E, is pushed forwards from behind by one man, while another is lifting up the lever, B, till it reaches the stops, e, f; the man at the handle then pushes it down, and cuts the length of a hoop at once off the plate, when the lever is down the under side of it pushes down the stop, f, so that the hoop may fall off; when the lever is lifted up to cut another hoop as before. The holes for the rivets of the hoops are next punched by a machine, represented in fig. 18. A is an iron lever, having a punch fixed.
fixed in it at B. under this is fixed a dove-tailed groove, C, to hold a piece of fixed, d, which has several holes of different sizes in it, to suit different punches, any one of which can be brought under the punch, and fixed by the screws, in each side of the groove, C: across the top of the groove, an iron plate, e, is fixed, with a hole in it, for the punch to go through; its use is to prevent the hoop, (which is put under it), after it is punched, from slipping with the punch; D is a screw put into the bench, to prevent the punch from being driven too far into the hole; the boy who works this machine lifts up the lever, A, puts one end of the hoop under the plate, e, and then pushes it down, which makes the hole; he then lifts it up again, and puts the other end under to make the hole in it; till looking the hole before made, over the plate, E, which determines its length.

After the hole is punched, a machine, shown in fig. 19, is used, to cut the ends of the loopholes; A is the lever, and B the cutter fastened to it; C is the other fixed cutter, which can be adjusted by a screw. E, fixed to the bench; F is a guide, between which the lever, A, piles, to keep it steady; the end of the piece of iron for the hoop, is laid by the boy who attends the machine, upon the fixed cutter, C, and the handle is pushed down to cut it off. The hoops are then bent round a block, and riveted in the common way. By these ingenious contrivances, the operations are rendered so simple, that a good workman will head and hoop 200 of the canoes in one day, working 14 hours; and two active men will cut with the shears, (fig. 16,) 63 hoops in a minute; great attention must be paid to keeping the trumph-hoops always of the proper size, as they are apt to expand with continual use, which is the reason of their being so thick, (fig. 15,) and if they are too large, the heads of the canoes will not fit.

CANTIEL, Cantellum, in Ancient English Writers, denotes a custom of selling by the lump, without tale or measure. Spleman derives the word from quadratum, and defines it by over measure, or what is added over and above strict measure. Kennet derives it from the old word cant, a hundred, that is the fable of about a hundred weight; answering to what we now call the taking of a hundred pound on content; as when we take it in a bag, sealed up without telling the price.

CANTIEL, Peter-Joseph, in Biography, was born in the diocese of Rouen, in 1645; and having entered into the society of the Jesuits, passed his days in their college at Paris, where he devoted himself to literature, with an ardour which hastened the termination of his life, in 1684. His principal labours confessed in preparing the Delphine editions of the classics; and he published Jullin and Valerius Maximus, the latter of which he enriched by five dissertations on Roman affairs. He also wrote a treatise "De Romana Republica," printed at Paris, in 1684, 12mo. and esteemed an excellent abridgment of Roman antiquities; also, "Metropolitanarum Urbium Historia Civilis et Ecclesiastica," tom. i. Paris, 1684, 4to. Nouv. Dict. Hiflor.

CANTELEU, in Geography, a town of France, in the department of the Lower Seine, and district of Rouen; one league W. from Rouen.

CANTEMIR, Demetrius, in Biography, prince of Moldavia, and a descendant of a noble Tartarian family, was born in 1673, and educated in part at Constantinople, whether he was lent in his youth as a kind of hostage. Disappointed by the Ottoman Porte in his expectations of succeeding his father, as prince of Moldavia, he conceived a prejudice against the Porte; and though he continued at Constantinople till the year 1712, when the war broke out between the Czar Peter the Great of Russia and the Porte, and was appointed by the latter, governor of Moldavia, he preferred the rank of prince of the country. With this view he violated his fidelity, and entered into an agreement of mutual aid and friendship with the czar. When the Russian arms failed of success, he was obliged to quit the Turkish territories, and to follow his new patron, who recommissioned him with the title of prince of the Russian empire, sovereignty over the Moldavians settled in Rossia, and other considerable appointments. His reference was at Charkof in the Ukraine till 1773, when he removed to Moscow. Here on occasion of his second marriage with a Russian princess in 1779, he showed his heart, and changed his Turkish name for the European. The czar made him a proxy-council; and Tcacovsky accompanied him in his different wars, conducting himself so as to gain general esteem. In 1786, on the ship he was shipwrecked, and lost several papers which he had taken great care and pains in compounding. He died at his estate in the Ukraine in 1793. Cantemir was industrious and learned, and is said to have understood 11 languages. He was the author of several works. His "History of the Growth and Decay of the Ottoman Empire," A.D. 1630 - 1682, written in Latin, and published in an English translation by Thiodal, Lond. 1724, fol. is charged by Gibbon (Hist. vol. xi. p. 434.) with containing strange blunders in oriental history; though he acknowledges the author was conversant with the language, annals, and institutions of the Turks. His "System of the Mahomettan Religion," was written and printed in the Russian language, by order of czar Peter; his moral dialogues entitled "The World and the Soul," were printed in Moldavia in Greek and Moldavian; "The present State of Moldavia," was printed in Latin; his "Musical Airs with Turkish Words," and "An Introduction to Music," in Moldavian. He was also the author of other pieces, which were either lost in his ship-wreck, or still remain in MS. Morei. Gen. Biog.

CANTEMIR, Antiochus, was the son of the preceding, by whom he was carefully educated, and initiated in letters. He was successively ambassador from the Russian court to those of London and Paris; and, in the different revolutions of his own country, he conducted himself with singular prudence. His chief distinction consisted in his having first applied Russian language to the composition of poems of any extent or dignity; and he wrote translations of Anacreon and the epistles of Horace, besides various satires, odes, fables, &c. His fates, like those of Bocion, were a happy mixture of strong sense and poetry, and many of his verses are become proverbial in the Russian language. He also published translations in prose of the "Plurality of Worlds," the "Persian Letters," and "Algarotti's Newtonian Dialogues." He was a member of the academy of Petersburg, and died in 1744. The abbé Guefor wrote his life in French, and translated his fates into that language. He was much inclined, at an early age, to the study of the Scriptures, and printed a "Concordance to the Psalms," in the Russian language. Nouv. Dict. Hist.

CANTER, William, an eminent linguist and philologer, was born at Utrecht of an eminent and respectable family in 1542, and studied first at Louvain, and then at Paris. Being obliged to leave Paris in 1561, on account of the civil wars, he visited several universities in Germany and Italy, and at length settled at Louvain, where he pursued his literary occupations with an affluency and ardour, which terminated his life at an early age in 1575. Thuanus says, that he deferred to be reckoned among the most learned men of his age, and laments his immature death as a great loss to literature. He understood six languages, besides that of his own country, viz. the Latin, Greek, Hebrew, French, etc.
French, Italian, and German. Temperate, and even abstruse in his diet, he was singularly methodical in the distribution of his time for study. He began at seven in the morning, and not sooner, because early rising did not suit his constitution, and required his literary avocations very intensely till half past eleven. He then walked out an hour before dinner, and another hour after he had dined. Having slept an hour upon his couch, he resumed his studies, and prosecuted them without interruption till midnight, devoting the last hours of the day to correspondence with his friends, and other busines that required a deep degree of attention and labour. He had collected, during his short life, a very excellent and curious library, consisting of the best authors in various languages, and a number of Greek MSS., which it was his intention to have published with Latin versions and notes, if his life had been prolonged. The damage which his library sustained from an inundation at Louvain in the winter of 1573, was an affliction, which would have proved fatal to him, if his friends had not affixed him in collecting his scattered books and MSS., and repairing the injury they had sustained. The principal works of Canter are eight books under the title of "Variae Lectiones," containing emendations and explanations of several ancient authors, published at different times, and reprinted in Gruter's Tho- faurus, tom. iii. Latin versions of the "Cæsannia of Ly- cophron," of some "Pythagorean Ethical Fragments of Stobæus," of the "Difficulties of Aristides," and of the "Syn- thesis," &c. Notes on the "Familiar Epistles and Offices of Cicero," various readings on several MSS. of the "Sep- tuagint," editions of "Euripides," of "Aeschylus," of "Sophocles," and of various other authors; and several Latin poems in the Deliciae Poetarum Belgarum. Morei.

Canter, in the Manor, denotes the flow gallop, which is a soft and easy pace in which most people delight. Berenger (Hist. and Art of horsemanship, vol. i. p. 71.) conjectures, that our word canter, expressive of this pace, may owe its derivation to the Latin term "Cantherius," which was the appellation of the horse, that usually performed it. Dr. Johnston, in his Dictionary, calls this pace the Canterbury gallop, and defines it to be the hand gallop of an ambling horse, called a canter, and probably derived from the matters riding to Canterbury on easy ambling horses. "How just the derivation may be," says Berenger, "I will not presume to decide; but the definition must puzzle all who are horsemen, and all who are not." See Cantheri.

CANTERBURY, in Geography, is the capital of the county of Kent, and the metropolitical see of the archbishop, who is primate of all England. The present city occupies a site which, during the Roman colonization of Great Britain, was a military station of that warlike people, and, according to the opinion of many eminent antiquaries, was the Durovernum of Antoninus's Itinerary. Three other principal Roman stations, which Mr. Somner calls Castra Riparenfæ, were connected with this, by three different Roman roads, some traces of which have been discovered. The names of these stations, and their respective distances, are thus given by Antoninus. From Durovernum to ad portum Rutupis (Richborough) 12 miles; to ad portum Dubris (Dover) 14 miles; and to ad portum Lemnianum (Lime) 16 miles. Without entering into the Roman history of this place, it may suffice to remark, that various relics of that people have occasionally been found here. Besides some seats and walls, which appear to have a Roman foundation: from: Masonic pavements, urns, coins, &c. that have been discovered, are evident memorials of that people. In the Saxon heptarchy, Canterbury, or, as they called, Cantwarabrig, was the principal place in the kingdom of Kent, and, during the reign of Ethelbert, was constituted the metropolitical see of all England. This monarch, having given a favourable reception to St. Aulfin, and his forty monks, who landed in the life of Thangest in the year 597, was pleased to affix for their residence that part of the ancient Durov- vernum which is now called "Stable-gate," and which had formerly been a kind of chapel, or oratory for the royal fa- milv, where they had been accustomed to worship, and Sacrifice to their gods. The munioners entered the town in procession, singing a hymn. They were first restricted to the precincts, and, though zealous in their ministerial functions, did not make much progress in converting profesties, till the king assented, and recommended Christianity. This example produced numerous converts; and some monkish chron- iclers do not hesitate to affort, that 10,000 perons of both sexes were baptized in the river Swale in one day. This is too improbable to be credited in the present age. Au- gustin having, however, completely established himself here, dedicated an ancient church to the honour of Christ, and Ethelbert founded an abbey, which was afterwards called St. Augustin's, the site, &c. of which has since been occupied by the bishop's palace. (See Augustin, vol. iii.)

Canterbury is particularly distinguished for its military, as well as ecclesiastical fame. Successively occupied by the Romans, Saxons, Normans, &c. it became the scene of re- peated sieges and battles in the respective wars of each nation. It pofted a castle at the Norman Conquest, as it appears from the Domesday-book that the conqueror ob- tained it in exchange from the archbishop and abbot of St. Augustin's. The outer walls, and walls, appear to have in- cluded an area of about four acres of land. Nearly the whole of this fortress has been destroyed, and its fosses filled up. The walls and gates, which formerly surrounded the city, have nearly suffered the same fate. Some of the latter remain, and parts of the former still retain their original cha- racteristics. The whole extent of the wall measured nearly one mile and three quarters in circumference. Its thick- nesses, on a medium, is about five feet, and at certain intervals were formerly twenty-one fortified towers. Without, there was a deep foss, nearly 150 feet wide, which environed the whole. The different entrances to the city were protec- ted by fix fortified gates, each of which gives name to the respective wards, or parts of the city, wherein they are situa- ted. Besides these, there were some smaller passageways through the walls, called pellens. Wall-gate stands on a bridge, which crosses the river Stour, and is the largest of these structures. It consists of two lofty spacious towers, emar- tled, particolled, and machicolated, and is now used as the city prison. Archbishop Sudbury is said to have built this gateway, and the wall which proceeded from it northward on the bank of the river. Further north, is a small pellern entrance, and near it is a large pile of building, called the Abbots-nunn, the machinery of which was con- structed principally from designs, by that great engineer, the late John Smeaton. The Northgate is very peculiar and remarkable, from having a long narrow church over it, which takes its name from the gate. Next to this, east- ward, was Queeningate, in which part of a Roman arch may yet be discovered on the outside of the wall. Near this is a pellern, which is occasionally opened for the convenience of the deanery, and some of the prebendal houses. Burgate, and St. George's gate, are in the eastern side of the wall. The latter is directly opposite to Wellgate, and is con- structed and fortified in the same manner. In each tower of this gateway is a cillern, from which pipes slided, to convey water to different parts of the city. Besides these, there were nine other gates, which belonged to the cathedral and to the monastery.
monastery. Some of these are distinguished for their architectural ornaments; particularly that of Christ-Church. This, says Mr. Summer, is a very glossy, strong, and beautiful structure, and, according to an inscription on the cornice, was built in the year 1517. The principal front of this building is highly enriched with niches, canopies, shields, and other ornaments. The most considerable building, and greatest ornament of Canterbury, is the cathedral church, dedicated to Christ. This magnificent and spacious edifice displays the various styles of architecture which characterized different ages from the eleventh to the sixteenth century. The Danes besieged this city in 1014, and on the twentieth day of the siege let it on fire, and completely burnt the cathedral. Lecithius, or Agitus, the archbishop who governed the see from 1020 to 1038, refounded, and made considerable progress in rebuilding this structure, which was again burnt in 1067. The present edifice appears to have obtained its foundation from archbishop Lanfranc, who was invited from Normandy by the Conqueror, in 1073. He is said to have completed the building, according to the then prevailing Roman style, in the course of seven years. In consequence of accidents by fire, and the dilapidations of time, different subsequeint archbishops made various alterations, additions, and improvements: but to particularize the whole would exceed our due limits. One or two prominent circumstances must suffice for the present work. Further, and very detailed particulars may be found in Dart's "History of Canterbury Cathedral," and in Goffin's "Walk in, and about Canterbury." In 1330, the new choir, built by archbishop Anselm, was dedicated with great solemnity in the presence of king Henry I. and his queen, David, king of Scotland, and many of the nobility of both kingdoms. On the 26th of December, 1370, archbishop Becket was barbarously murdered at the foot of the altar. He was buried here, where a magnificent shrine was erected to his memory, and the monks having canonized him, his tomb was reforted to by an innumerable concourse of pilgrims from all parts of Christiantized Europe. This circumstance gave more extensive celebrity to Canterbury than any other event, and from that period the place continued to increase in monastic buildings and inhabitants, till Henry VIII. dissolved the bigoted delusion and the religious foundations at once. Erelonus and Stowe have each given a particular description of Becket's shrine, from which it appears that besides a coffin of gold, there were many jewels, &c., employed to decorate the remains of this saint. (See Becket, vol. iv. p. 1.) The present cathedral consists of a nave, aisles, choir, transepts; two towers rising at the west end, one rifting from the centre, some private chapels, or oratories, a chapter-house, cloisters, &c. Some of these buildings display much skill and beauty in their architecture, and some are further ornamented by many ancient and curious monuments. Among the latter may be noticed theoile of Henry IV. and his queen; Edward the black prince; cardinals Chatillon and Pole; archbishops Courtney, Chicheley, Bourchier, Walter, Reynolds, Kemp, Stratford, Peckham, Warham, Langton, and Sudbury; besides many others erected to the memory of eminent and distinguished characters. At a short distance from the city walls, are the remains of St. Augustin's monastery, which was certainly the first Christian establishment in Great Britain. This was burnt in 978, and though at first only a small foundation, soon increased in extent and revenues. Patronized by a king, and under the government of a man like Augustin, it attracted the company and property of numerous devotees from all parts of the converted island; and in proportion as Christiannity was extended, so was the sacred fame of this place propagated.

At the dissolution, Henry VIII. seized the town, and intended to make it a palace for himself. It was afterward granted to cardinal Pole; and in 1573, queen Elizabeth kept her court here in her progress through Kent. The boundary wall included about six acres of land. Some of the remaining buildings are appropriated to a brewery, and its fine entrance gate-way, though still a beautiful object, is gradually crumbling away.

Canterbury formerly contained seventeen churches and parishes within the walls, and three in the suburbs; but of these only fifteen remain. The Jews, Presbyterians, Quakers, Methodists, and Baptists, have each their respective places of worship. Among the buildings we may particularize the following: Having formed both beautiful and curious to entice them to the notice of the inquisitive traveller. St. Martin's church, being composed partly of Roman brick, is considered the most ancient building in the city. St. Dunstan's church is a large, handsome structure. St. Margaret's church contains an ecclesiastical court, where the archbishop, archdeacon, &c. hold their several visitations; and where various causes relating to ecclesiastical affairs are tried. This city is provided with many other public edifices; and its hospitals and other charitable establishments are numerous. Here are two public libraries, a prison for Eait Kent, a free grammar school, a theatre, assembly rooms, and a large guild-hall, which, besides containing several convenient apartments, is embellished with some portraits of persons who were benefactors to the city. The city workhouse was established by act of parliament in 1728. The name of Chancer, and his Canterbury tales, with the Chequer inn, which was at one time occupied by our veteran poet and his fellow-pilgrims, will long be associated in the memory of all lovers of old English poetry.

The corporation of the city consists of a mayor, recorder, twelve aldermen, a chamberlain, town-clerk, twenty-four common council men, and some inferior officers. It sends two members to the imperial parliament, who are elected by the freemen, of whom there are resident, and non-resident, upwards of 1600. An act of parliament for paving, lighting, and watching the city was obtained in 1757, since which time the appearance of Canterbury has been materially improved, and its local advantages greatly augmented. The road-way of all the principal streets is paved with Guernsey pebbles, and the foot-paths with Yorkshire squared stones.

Canterbury is fitted in a fine valley on the banks of the river Stour, which, dividing itself into different channels, thus forms five or six islands, some of which are built on, and are united to other parts of the city by bridges. At the southern side of the walls is an artificial conical eminence, called Dane John Hill, or Dungie-Hill. This mound and its vicinity having been judiciously planted, and laid out in pleasant walks, is thereby rendered a very attractive and delightful promenade to the citizens. The principal manufactories of the city are for worsted, silk, and cotton, and here is a manufactory for blending silk and cotton, or silk and worsted, which is known by the name of Canterbury muslin, or bullis. In the environs of the city are numerous hop plantations. See Kent.

Canterbury being a county in itself, its magistrates have authority to determine all disputes at law between the citizens, and to try capital offences. On these occasions the mayor sits as judge, attended by the recorder, and the bench of aldermen. This city is 55 miles east from London, and has markets on Wednesdays and Saturdays, besides several fairs. The horses in 1800 amounted to 17,000, and the inhabitants to 5000. Goffin's "Walk in and about the City of Canter-
CANTERBURY, or CANTERBRY, in *Ancient Architecture*, rafter, or joints of a house, which reach down from the ridge to the caves.

CANTH, in *Geography*, a town of Silesia, in the principality of Breslau, on the Wilitzer; 12 miles S.W. of Breslau.

CANTHAREE, among the *Anteians*, a kind of candlestick. See Branch.

CANTHARELLUS, in *Botany*, (Jull. 4. Meruliis, Writ.) See Agaricus and Meruliis.

CANTHARELLUS, in *Entomology*, 3 species of Staphylinus, of a black colour, with the wing-cases glaucous, and yellowish at the tip. *Inhabit* Sweden. *Gmelin.*

CANTHARIAS longis, in *Natural History*, a name given by some writers to a follicle substance supposed to resemble a beetle. We sometimes meet with parts of the ichthyoptery or bony parts of fishes, which are ridged longitudinally, much in the manner of the outer wing of some of the beetle tribe; and from their size and shape, which is an oblong, or oval one of the bigness of a common beetle, and sometimes of the largest, and at others of the very smallest kinds; these have been called by some, petrified beetles and cantharia lapisides; others have extended the name to such species of amber as have in them the body or any fragment of the beetle of any species.

CANTHARIDES, in the *Materia Medica*, are beautiful green flies with a golden burnish, found in the south of France, in Spain and Italy, of very important use in the Materia Medica. (For the natural history of this fly, see Meloe Vespicatorius.) The cantharides of Italy are the largest, but the Spanish are accounted the best, and are the most valued, whence the insect is also commonly known by the name of Spanish Fly.

When these flies appear in swarms, they are accompanied by a very distasteful and fetid smell like that of mice, and this effluvium is so powerful, when proceeding from a large swarm, that perforce exposed to it, experience symptoms of strangury, and ador urine, pain in the eyes, and violent itching over the body.

The common way of collecting these insects is, to spread cloths under the trees containing them, to shake them down, and then kill them by putting them on a hair sieve and exposing them to the vapour of boiling vinegar, or elfe (which is the commonest mode) simply to immerse them in vinegar and water. They are then dried thoroughly, either in the sun or in airy chambers, being frequently turned by the hands armed with gloves. They are then well and carefully packed in clove wooden barrels lined on the inside with paper. The insect, when well dried, is so light as to weigh no more, on an average, than about a grain and a half.

Cantharides in this state will keep well for a considerable time, and if in clove vessels, they hardly acquire any smell, but in open vessels and in the damp, they putrify in some degree. They are liable, however, notwithstanding their very corrosive quality, to be attacked by very small worms, which gradually crumble them to powder in every part except the wings. The acid quality, however, is not very materially injured thereby, and remains for a great length of time, though slowly diminishing in intensity.

The singularly acid property of cantharides has led several chemists to endeavour by chemical analysis, to determine in what principle it resided. Thouvenel’s experiments on this subject are of some importance. This chemist found four distinct substances in cantharides, some of which are doublets till further decomposable. After softening them with warm water, he submitted them to strong pressure, which left behind about half the weight of a parenchymatous matter that was not further attended to. Hot water then extracted about 2 of the whole weight of a yellowish red and very bitter substance, which gave an acid by distillation, and melted out a quantity of yellow oil which boiled at top.

This latter concrete by cooling, and has a very acrid taste and the peculiar smell of the insect. Heated with ether, it separates into two distinct conceivably oily matters, that are soluble in either, being green, waxy, and peculiarly acrid, and the other untouched by this menstrum, remaining yellow.

The green oil is about 2 of the whole, and the yellow oil after this has been separated, amounts to about a fifth. All the active medicinal properties have been supposed to reside in these oils, and especially the green. The truth of this supposition is somewhat questionable to the full extent, since this oil is insoluble in water, which liquid certainly extracts some acid properties from the insect, but it is yet highly probable, that it is the most active portion. This concrete oil being very difficult of putrefaction and more of the nature of resin, will also explain why the virtue of the insect remains so active after very long keeping. The whole of the active power of the insect, both which resides in the oil and in the extract, is readily dissolved by alcohol diluted with as much water; and in this way the tincture of cantharides is prepared. Something further, however, may probably be done on this subject by an able chemist who should pursue this research.

Cantharides have a peculiar and somewhat nauseous smell. When taken into the mouth, no taste is at first perceived, but after a while, a senation of burning comes on which is very durable. Taken into the stomach even in the dose of two or three grains, it produces most excruciating pain and sensation of burning, inflaming and excoriating the whole intestinal canal, and producing death with great agony. It also has a peculiar tendency to affect the urinary organs, occasioning very acute pain and burning on passing the water, often attended with blood, and also with strangury, or a painful difficulty of passing it. These affections of the bladder often are felt in a lighter degree after the external use of this insect.

The chief use to which cantharides are applied is, in *Blisters*, as has already been fully described under that article, and need not here be repeated. No other known substance answers the effect so certainly, so extensively, and on the whole, so easily to the patient, and hence this insect is one of the most valuable articles of the materia medica. Much refinement has been attempted in the composition of the different blistering plasters, and many additions have been proposed, but with very dubious advantage. It does not appear that any substance can add to the vesicating power of the fly when fresh and good, and when a diminished effect is wanted, the simplest and surest way is, either to lessen the quantity of the cantharides or the usual time of its application.
The internal use of cantharides is justified by found experience, but on account of its extreme danger, it should be employed with great caution. The minor affection is generally the first and most unmistakable sign of an excessive dose. It is given internally sometimes in drops, and formerly in debility of the urinary and generative organs. Camphor is laid to check the disposition to strangury, but this is most doubtful. Opium is more certainly an useful addition. The dose of the fly in substance is about half a grain, and can seldom be borne oftener than once or at most, twice a day. The use of cantharides is also used internally in doses of from ten to twenty drops. Besides the above-mentioned uses of this medicine, the juice has often been found of singular service joined with decoction of elm-bark or farlaoprinse, in oblique cutaneous diseases. The juice is used externally as a stimulant application.

CANTHARIUM, in Botany, (Rumph. Anth.) See 
Nepenthis Distillatoria.

CANTHARINUS, in Entomology, a species of Cerat 
byx, (Saperda Fabr.) that inhabits Germany. The 
colour is ferruginous: thorax cylindrical, with the antenna and legs black. Fab. Linn. &c.

CANTHARINUS, in Entomology, a species of Cimex. The 
colour of this insect is black: thorax armed with a single tooth, and marked with a white circle: wing-cases cinereous, with four yellow spots: feceal yellow. A native of Denmark. Mull. Zool. Dan.

CANTHARIS, in Entomology, a genus of Coleopterous 
sects distinguished by having the antenna filiform: thorax 
in general margined, and shorter than the head: wing-cases 
flexile: tides of the abdomen edged with folded papillae. Linn. &c.

The species of this genus Gimelin divides into three 
sections, the first containing those which have four hatchet-
shaped feelers; the second, those with filiform feelers, the 
last joint of which is fuscous, (or true Mahachins of Fabricius) and the Lymexylus, or those having the anterior 
feelers projecting, the last joint but one, with a large ovate 
segment, and the last joint ovate and acute. The 
species are these:

Section 1, viridescens, fusca, marginella, media, hae 
matolomia, punctata, dichroma, multicolor, livida, difictata, 
exsula, livida, rugifera, jambe, lateralis, marmagdula, 
biguttata, minima, cardiace, albicans, tellacea, atrum, 
marginea, hisnaculata, pallipes, pallida, ruficollis, flavipes, 
melecanopha, bipunctata, angulata, nigra, pulicaria, car 
nesceina, coccinea, bicolor, bilineata, triuncla, alitci, occu 
latata, collaria, cuprea, argentea, janthina, americana, rubi 
pes, brucuifera, fulva, serrata, tropica, fonchii, capifica, fal 
veola, violacea, viridescens, lepturides, nigripes, melanura, 
hirta, picea, chalybida, tricolor:

Section 2, aerea, bipunctata, hemorroidalis, virid 
ibus, fanguinolenta, cyanus, pedicularia, nemoralis, fuscata, eque 
tris, oecrhus, chrysolomides, ceruscocephala, suecia, 
Herbii, erythroclausa:

Section 3, abbreviata, proboscidea, barbata, navalis, fax 
onica, morio, which respectively.

Obi. The Fabrician genus Cantharis, includes only 
thefe Linnaeian species of the genus that have four hatched-
shaped feelers: Jaws bifid; lip entire; and antenna fili 
form.

CANTHARIUM, in Ancient Geography, the most 
western promontory of the Isle of Samos.

CANTHARUS of a Fountain, among Roman writers, 
denotes the part, or apparatus, out of which the water 
issues.

It was made in divers forms, sometimes in that of a shell, 
at other times in that of an animal, which yielded water 
at its mouth, eyes, and the like.

CANTHARUS, in Embryological Writers, denotes a foun 
tain, or cistern, in the middle of the Town, before the an 
cient churches, wherein persons washed their hands and 
feet before they entered.

CANTHARUS, in Entomology, a species of Skittis. The 
tail is immaculate, and the body bidentate longitudinally 
with yellow. Linn. Arted. &c. Inhabits the Medi 
terranean.

CANTHELEA, or CANTHALIA, in Ancient Geography, 
a maritime town of Africa, in the territory of Carthage, 
in the vicinity of Carthagin. This town is said to have 
received its appellation from the Pagan debt Saturn; for, 
according to Sanchoniatho and Damascius, the word of 
the Phoenician tongue had a particular relation to that deity. 
In confirmation of this opinion it is added, that there was 
a town in that place called "Vicus Saturni," the direct 
or town of Saturn, where Jerome is said to have lodged 
during his exile in Carthia.

CANTHERII, in Antiquity, a general name applied by 
the Romans to horses used on many different occasions, 
but which was always understood to mean "geldings." 
Many unsatisfactory conjectures have been formed concerning 
the etymology of this word. The best explanation, says 
Hieronymus (Hilt. &c. of Horsemanship, p. 71) seems to be 
that which deduces it from the Greek, χανθείον, cantheion, 
which, by no unusual change of one letter for another, may 
be made "cantherion;" signifying, in its original sense, 
a pack-faddle; and as it was usual to calibrate the "can 
therii," or pack-horses, in order to make them gentle and 
quiet, it became a custom to call all calibrated horses, 
"cantherii," though appointed to other services beside that 
of carrying packs or burdens. In process of time, people, 
who, for various reasons, rode on horseback, began to 
use these cantherii, or geldings, for their gentleman's temper, 
to other horses.

CANTHICOLUS, or IRINUS, in Ancient Geography, 
a gulf of India, according to Polteny, into the northern 
part of which the river Indus discharges itself.

CANTHICUS, in Anatomy, a port of the Indian sea, to 
the west of the most western mouth of the River Indus.

CANTHICUS, in Botany, a genus formed by La Mark 
and adopted by Jussieu, for two plants nearly allied to 
Gardenia and Coffea; but flated by La Mark to differ from 
the former in their two-seeded berries, and from the latter, in 
their short flowers and simple stigma. One of them is 
Gardenia spinae of the younger Linneus, G. Dumetorum of 
Willdenow, which for the other, see Webera 
Tetrandra. As La Mark has not infected this genus in his 
Illustrations, he appears to have since formed a different 
judgment concerning it, but as the detail of species in that 
work is not yet complete, it cannot be determined in what 
manner he would now dispose of these two plants. We 
have followed the arrangement of Willdenow.

CANTHUS, in Anatomy, the junction of the superior 
and inferior eyelids. Hence there is an internal and 
an external canthus. These parts are also called the angles 
of the eye; that which is towards the nose being termed 
the inner or greater angle; and that which is towards the 
temple, the outer or lesser angle of the eye.

CANTHUS, in Chemistry, the lip of a vessel; or that part 
of the mouth of a vessel, which is a little hollowed, or de 
pressed, for the easy pouring off a liquor.

Hence, to pour by decantation, is to pour through that 
place.

CANTHUS, in Entomology, a species of Papilio (Dan. 
Fbs.)
that inhabits North America, the wings of which are entire, and fuscous above: anterior pair immaculate: on the upper surface of the posterior ones fix ocular spots. Fabr. &c. Off. This insect is noticed by Lineaus (Annot. Anim.) under the name of Papilio Eurydice, and it is also Papilio Argente of Cramer.

CANTICL. Carmina lefebri. Songs sung through the streets of Florence in the Carnival, by persons in masks, during the time of Lorenzo il Magnifico. These songs, after the manner of the Greek feoda, were applicable to persons of different trades and occupations; among the rest there is one for those who played on the rucbe, the trumpet, and various instruments of music used in the German troops, called by the Italians, Lunci. The first of these songs that were performed in this manner, were set by Arrigo Tudisco, Maestro di Cappella of the church of St. John, and a musician of great eminence, of whose compositions various specimens are preferred by Glorianus. Aut. Francisco Graevi, commonly called, Il Lati, collected and published the words of these songs in 2 vols. Svo., under the title of Tutti i trionfi. Carri, Moscografia a Canti Carmina lefebri andati per Firenze dal tempo del magnifico Lorenzo de' Medici sino al anno 1559. The poetry of these songs is still in great favour with the Florentines.

CANTICLE, a hymn or pious song: as, the Song of Songs, by Solomon. The first and most ancient canticles were composed on occasion of great and memorable events, and should be ranked among the most ancient historical monuments. Canticles were sung in church, and often accompanied with dances, as appears in the sacred writings, where the most considerable composition of this kind is the song of songs, which some authors imagine to be an epithalamium, composed by Solomon on his own nuptials with the daughter of the King of Egypt. But theologians find under this allegory, the union of Christ and the church. M. Caluance saw nothing in the song of songs, but a regular opera: the scenes, recitatives, duets, chorusses, every thing necessary to an opera, according to him, is contained in this canticle, and he doubts not but that it has been represented.

CANTICLES, or the Song of Songs, in Biblical History, a Hebrew mode of expression to denote a song superlatively excellent in file and sentiment. Of this ancient poem, the author is ascertained, by the unanimous voice of antiquity, to have been Solomon; and this tradition is corroborated by many internal marks of authenticity. In the very first verse it is said to belong to Solomon: he is the subject of the piece, and the principal actor in the conduct of it. Allusion is made to the rich furniture of his palace, chap. i. 5.; to the horses and chariots which he purchased of Pharaoh king of Egypt, i. 9. 1 Kings x. 28, 29.; to Amminadab, who was eminent for such chariots, and who married one of Solomon's daughters, vi. 12. 1 Kings iv. 11.; to his building of the temple, under the figure of a palaquin or coach for his bride, iii. 9. 10.; to the materials of which it was formed brought from Lebanon and other hills, iv. 8. In a word, all the leading circumstances of Solomon's life in a religious view appear to be alluded to, or implied in this ancient poem, and therefore render it probable that it was a production of some writer in his age, if not his own composition.

That the Song of Songs, from the most early period, was deemed a sacred book, and ranked with the Hagiographa of the Jews, and thence received among the canonical books of the Old Testament, may be inferred from the following confederations. A translation of it is ascribed to the seventy Jews, who flourished about 300 years before Christ, and which still forms a part of the Alexandrian version. With the same conviction of the sacred character of the work, it was rendered into Greek, in the second century, by Aquila, Symmachus, and Theodotion. Origen, on the authority of the Jews, contemporary with him, and whom he was in the habit of consulting respecting the authority and literal import of their sacred books, inferred it in his Hexapla, and wrote some homilies upon it, explaining its mystical sense, which have in part been translated into Latin by Jerome. That the ancient Jews, without exception, considered it as a production divinely inspired, appears moreover from the allegorical signification annexed to it by the Chaldee paraphrase. Josephus, in his answer to Apion, lib. i. 38, gives a catalogue of the Jewish books, and includes in the third class of such as related to moral instruction the Song of Songs. See Bible and Canon. Eusebius, also, following his footsteps, makes it the fifteenth of that number. See his Ecclef. Hist. lib. vi. cap. 25. From the Jewish synagogues, the book of Canticles was received into the Christian church, without any doubt of its divine authority. This appears from Origen and Eusebius. It is cited by Ignatius, about the beginning of the second century, as a book of authority in the church at Antioch. It is included in the canon of the apostles. See Canon. And in the apostolical constitutions, a passage from the Canticles is quoted. Con. vi. 13. 18. See Constitutions, apoc.

Though the Song of Songs comes down to us recommended by the voice of antiquity, its divine authority has been called in question by many writers in modern days. Wharton thinks it a dissolute love song, composed by Solomon when advanced in years, and degenerate in practice; and that therefore it ought to be excluded from the canon of the sacred books. Taken indeed in its primary and literal sense, it must be considered as describing a royal marriage, and may therefore be denominated an epithalamium or nuptial song. The celebrated Michaelis supposed that the object of it was to teach God's approbation of marriage. But the ideas of Harmer appear much more rational, who, though unwilling to give it the name of epithalamium, thinks it a marriage song to be explained by compositions of a similar nature in eastern countries. "What can be more likely," says he, "to lead us into the literal sense of an ancient nuptial poem than the comparing it with similar modern productions of the East, along with antique Jewish compositions of the same kind?" Boffuet, bishop of Meaux, was of opinion that this song was to be explained by the consideration, that the Jews were wont to celebrate their nuptials for seven days together, distinguished from each other by different solemnities; and this notion has been adopted by the author of "A New Translation of Solomon's Songs, with a Commentary and Annotations." The principal objection to this opinion is, that the conduct of the poem does not admit of such a distribution; and the distinguishing each day by some distinct ceremony is a mere supposition unsupported by fact.

The elegant and learned bishop Lowth devotes two of his Prelections to an examination of this poem, and he determines it, with Boffuet, to be a sacred drama, though deficient in some of the essential requisites of dramatic composition. Sir W. Jones, from his knowledge of Eastern poetry, was led to compare some parts of it with familiar productions among the Arabsians, and delivers it as his opinion, that it is to be classed with the Hebrew idyls. Pocf. Afiat. Con. p. 92. Supported by the high authority of this illustrious scholar, Mr. M. Good, in an elegant metrical version with which he has favoured the public, considers the Song of Songs.
Songs as forming not one continued and individual poem, but a series of poems, each distinct and independent of the other; and he denominates them sacred idylls. "The Song of Songs," he says, "cannot be one connected epithalmion, since the transitions are too abrupt for the wilder flights of the Oriental muse, and evidently imply a variety of openings and transitions; while, as a regular drama, it is deficient in every requisite that could give it such a classification."

In opposition to this it may be remarked, that the subject of the poem, from beginning to end, is the same; the personages, introduced as speakers, are the same; and, though to a modern reader the transitions in many places may seem abrupt, and the thoughts unconnected, the conduct of the piece is not suspended, but carried on under a fable regularly constructed, and terminating in a conclusion interesting and unexpected. The apparent want of connection in the sentiments of an ancient dramatic composition must be manifest; and it is the business of a critic to remove those causses, by pointing out the place of representation; by affixing to the proper characters their respective speeches; by unfolding in the history of the times, the event on which the fable is constructed; by marking the commencement and close of the several acts or stages of the action: in a word, by conveying his own imagination, and that of his reader, to the place of exhibition, and thus calling the eye, as it were, to the affluence of the ear in developing the unity of the subject, and supplying the smoothness of the transitions.

Having thus produced the sentiments of others respecting the nature and object of the Canticles, we shall next briefly state those of an ingenious friend, who considers it, for the reasons which he has adduced, as a parable in the form of a drama.

Firstly, When closely examined, it will appear to possess all the essential qualities of a drama. The marriage of Solomon with the daughter of Pharaoh, (as related 1 Kings i. 1.) a political event which, from the personages concerned in it, would be interesting to the Jewish nation, was, as such, proper to furnish the fable of it. The writer is entirely left behind the curtain, and the whole of the composition is brought forward before the reader in parts between the speakers. The dramatis personae are Solomon, the bride, her attendants, and the virgins of Jerusalem. It should be observed, though the fact has indeed been overlooked by the critics, that all advance is made by the lady herself. She comes to his palace unfetiched, and apparently unfetiched. Finding him not there, she goes in search of him, intreats to be received into his embrace; and when, without denying, he eludes her intreaties, she pursues him in the ardour of her affection almost beyond the bounds of female delicacy and modesty. On the contrary, the royal spouse is cold at heart, and distant, prone to recede, and to intrigue with his favourite concubines, but anxious to conceal his indifference and infidelity under laboured encomiums on the beauty of his spouse. The action is complete, polishing a beginning, a middle, and an end, and compofed of scenes, the shifting of which, if observed by a modern reader as by an ancient spectator, would have preferred the conduct of the piece uniform and condense. The plot, it must be allowed, is very simple, the inconsistencies of it arising only from those unforeseen impediments which were thrown by rival beauties in the way of the royal bride, and which threatened to deprive her of the object of her attachment. The catastrophe is the triumph of honourable love over the allurements of seduction, and the security of virtuous enjoyment over the torments of jealousy and illicit fruition.

Secondly, Considered as a parable, like other parables, while it conveys a literal fenee interesting and appropriate, it conveys likewise a religious lesson of supreme importance. Now the method of deciphering a fable or parable is, not by seeking under the veil of the allegory certain maxims of recondite wisdom, which bear no resemblance to the literal fenee, but by facts generally known and fully understood; nor is the interpretation to be deemed true unless, as in the case of the parable of Naaman or that of the laven, these exhibit an obvious and characteristic analogy between the fimple and the metaphorical accretions. On this principle, it is apprehended that, in the parable of the Canticles, the bride means the Jewish religion, and the royal spouse the Jewish nation, represented under the name and person of their ruler and chief; and the object of it is to delineate, under images borrowed from the communal state, the conduct of the Israelites at large, and that of Solomon in particular, in respect to their knowledge and worship of Jehovah.

In proof of this position, it will be necessary to specify a few leading particulars.

1. The relation subsisting between Jehovah and the Jews, as his chosen people, is usually described, in the Jewish writings, in language expressive of the relation between a husband and the woman who is the object of his peculiar affection and choice. See 1Sa. iv. 5. Jer. iii. 1. Ezek. xvi. xxiii. Hof. i. Mat. ix. 15. xxv. Rev. xix. 7.

2. The description, given in the poem, of the royal bride consuits of those figures and allusions which, in other parts of the Jewish scriptures, are employed to delineate the character of true religion. Thus she is said to be a fountain, to be a garden, to have a vineyard, to be more delicious than wine. See 1Sa. iv. 1. Mark xii. 1. Isa. xii. 2, 3. John iv. 14. vii. 37. Pf. xix. 10.

3. While the royal lover is lavish of his encomiums on the beauty of his bride, he was cold and faithless, and all advance is made by herself. This delineates with exactness the character of the Jews, with respect to their religion. It was bestowed upon them unasked and unforced. While loud in praise of their worship, they were ever prone to the idolatry of their neighbours; and the God they were forfaking ceased not, as it were, to pursue them, and to solicit their return to him. We read of Solomon, (1 Kings i. 1-7.) that the strange women he married were the means of seducing his heart from God; and the bride seems to have been sensible that the virgins, with whom he associated, were the cauue of alienating his affections from her, and the repeatedly intreats them not to far up use assume her beloved.

4. Solomon built a temple in which the knowledge and worship of the true God might be cultivated; and the service of the temple was appointed by the wisdom of heaven to be but an introduction to the more rational service of the Christian church. For this reason, the temple might be considered as the cradle or couch in which the Jewish religion was to be nurtured, and, as it were, to be conveyed home to her parent's house; that house of which God was the owner and author, and of which Christ was the chief corner-stone. Accordingly the royal lover is represented as making a couch for the bride. In this grand palaquin she is conveyed home with her husband; and here she expects to enjoy his undivided attachment, without any apprehension from the seductive arts of her rivals. And it is certain that those of the Jews who passed over from the temple to the Christian church never afterwards relapsed to idolatry, but ever remained faithful to the worship of the true God.

5. The temple being made of the wood of Lebanon, the bridal couch is, for this reason, represented as made of the same timber. Hence with much propriety the royal lover invites his bride to come from Lebanon, and other hills,
whence the materials for the temple were brought; and hence too, with equal propriety, the language in which the husband celebrates the accomplishments of his spouse is copied from that temple which was devoted to her service.

6. When they arrived in the parent's house, the informs her husband, "We have a filer who is little, and hath no bosom." Which means that, when the Jewish temple was exchanged for the church of Christ, Judaism itself pointed out the gospel dispensation, which being in its infancy encumbered with rites and ceremonies, had not yet all its vigour and purity. To the information of the bride respecting the younger sister the king replies, "If she be a wall, we will build for her a palace of silver; and if she be a door, we will enclose her with boards of cedar." Which is to this effect: "If the new religion, the younger sister, be intended as a wall or an additional security of the old; if the religion of the gospel prove an auxiliary to the service of the temple, we Jews will erect for her portion a splendid edifice; we will adopt her as a beautiful appendage of Judaism: but if, on the other hand, she will abolish the Levitical code, and throw open a door to receive the Gentiles to the privileges of the Jews, we will reject her, and endeavour to close up the breach which she has made in our dispensation." The answer of the bride is remarkable: "I am a wall," by which she delicately hints that she was the means of excluding the chosen people of God, and of separating them from the idolatry of their neighbours; but that her younger sister was intended to remove this wall of separation, and to unite the Gentiles with the Jews in the knowledge and worship of the true God."  

7. The gradual expansion of revelation, from the first dawn of it in the garden of Eden till it reached its meridian fulness, in consequence of the death and resurrection of Christ, is thus beautifully portrayed in the character of the bride: "Who is the that looketh forth as the morning, fair as the moon, bright as the sun, and serene as the starry hosts?"

Finally, The royal husband addresses his bride as being at the same time his filer, My filer, my spouse. These two inconstant relations are now easily explained. The father of the husband, the Creator of the Jews, was also the author of their religion. The bridegroom and the bride, being descended from the same great Parent, were also a brother and sister.

The metaphorical sense thus capable of being put upon every part of this poem, justifies the high appellation of The Song of Songs, which has ever been given it. It accounts also for its being regarded, by Jews and Christians, as a sacred composition, and for its reception first into the Jewish, and then into the Christian canon. On its first publication its allegorical import must have been generally understood, and it was natural that, as with the process of time it became unintelligible, it should still retain the high rank and estimation which at first it so justly acquired. It was also equally natural in the first Christian writers, on receiving it into the canon of the Jewish scriptures, but without knowing the true significatior of it, to interpret it as referring to Christ and his church. The interpretation, however, though adopted by most modern divines, has only involved it in mystery, fancy, and absurdity; and the consequence was that its claims to inspiration have been called in question; nor is there any means of restoring it, in the estimation of rational critics, to the sacred writings, but by disclosing the beautiful lesson of religious wisdom concealed under the veil of its allegory. The epitome, respecting the younger brother and filer, demonstrates that its views terminate in the temple service. While, at the same time, the allusion at the close to the rite of the gospel, and the conversion of the Gentiles, which took place so many hundred years after Solomon, proves that the author was actuated by divine inspiration.

CANTICUM, Latin, in Mufe, a motet, anthem, or sacred song.

CANTI, in Ancient Geography, a people of Albion, or Britain, who inhabited that part of the country which from them was called Cantium. See CANTUM.

CANTILENA, in Mufe, an Italian word equivalent to melody, the treble, the principal part of a composition, opposed to the recitavo, or under parts, either in instrumental or vocal music.

CANTILLANA, in Geography, a town of Spain, in the country of Seville, seated on the Guadalquivir; 12 miles N.W. of Carmona.

CANTIMARONS, or CANTIMARONS, a kind of floats or rafts, used by the inhabitants of the coast of Cornwall to go a fishing in, and to trade along the coast. They are made of three or four small canoes, or trunks of trees dug hollow, and tied together with wicker ropes, with a triangular sail in the middle, made of mats. The persons who manage them are abash half in the water, there being only a place in the middle a little raised to hold their merchandise; which last particular is only to be understood of the trading cantimaron, and not of those who go fishing.

CANTING-ARMS, among Heredities, are those arms which express their owner's surname. These answer to what the French call armes portantes; they are a sort of rebukes, and are never prefixed to be noble. See Arms.

CANTING-QUOINS, in Ship Building, the name of canting-quoin. See Cant and Quoin.

CANTIGEBUS, in Ancient Geography, a town of Germany, placed by Ptolemy near the Danube.

CANTUM, as it is called by Caesar and Ptolemy, Cantia of Bede, now Kent, derives its name and that of its inhabitants, most probably, from the British word "Cant," which signifies an angle or corner, and applied to this part of Britain from its form and situation. It is separated from the continent by a narrow sea, called by Solinus "Fretum Gallicum," but by Tacitus and Ammianus Marcellinus "Fretum Oceanum," and "Oceanus Fretalis." The places of Cantium mentioned by the ancients are Durovernum, Durobrigia, Durolenum, Portus Rutupiae, Portus Dubris, Regulbium or Regulium, and Portus Lemanum, now Canterbury, Rochester, Lonham, Richborough, Dover, Reculver, and Leine. Ptolemy reckons Londinum, London, among the cities of the Cantii; but in this particular he was certainly mistaken. This was probably the first district of Britain which received a colony from the continent; and it is no less probable that it had frequently changed its masters, by new colonies, who came over from time to time, and drove the inhabitants farther north. Amidst all its revolutions it retains its appropriate name, and it was transferred to all the successive tribes by which it was inhabited. At the time of the Roman invasion its inhabitants were evidently of Belgic origin, who had arrived at so late a period, that they differed in no respect from their countrymen on the continent. "The inhabitants of Kent (says Caesar, Bell. Gall. i. v. 10.) are the most civilised of all the Britons, and differ but very little in their manners from the Gauls." This resemblance was owing to the proximity of their situation, which, being nearest to the continent, was most frequented by emigrants from thence. It was this situation, also, that exposed them to the first assaults of the Romans. Caesar, in both his expeditions into this island, landed in Kent; and therefore we may conclude, that the Cantii were principally concerned in the vigorous opposition that was made to his landing, and in the several
several skirmishes and battles that were fought against him after his landing; particularly, they made a very bold but unsuccessful attempt upon his naval camp. Their refuils, however, was less vigorous on the next invasion of the Romans, in the reign of Claudius; for we learn from Dio (l. b.) that Anius Plautus, the Roman general in that expedition, traversed their country without losing an enemy; and as they now submitted to the power of Rome without a struggle, so they continued in a state of quiet submission to it to the very last. Cantor, in the most perfect state of the Roman government, formed a part of the province which was called "Flavia Caearia." Henry’s Hist. vol. i. p. 273, 8vo.

CANTO’O denotes a part or division of a poem, referring to what is otherwise called a book. The word is Italian, and properly signifies song. Tasso, Ariosto, and several other Italians, have divided their longer or heroic poems into cantos. In imitation of them Scarron has also divided his Gigantomachia, and Boileau his Lutrin, into chants or songs. The like usage has been adopted by some English writers, as Butler, who has divided his Hudibras, and Dr. Garth his Dipsomancy, into cantos. A translator of part of Virgil’s Aeneid, has even subdivided a book of Virgil into several cantos.

CANTO, Ital. a song, part of a poem. Il canto, in Music, implies the first tole of a vocal composition, in four parts. In a chorus of more than four parts, there is frequently a second canto; as canto zdo. the second treble. Canto fermo, plain chant, canto Gregoriano, the Gregorian chant, or the chant instituted by pope Gregory, written in the Roman mifals, in square black notes, on three or four lines only. Canto figurato, florid counterpoint.

CANTOOCR, in Geography, a town of Pidmont, 23 miles N.N.W. of Turin.

CANTON, Jones, in Biography, an ingenious natural philosopher, was born at Strand in Gloucestershire, July 31, 1713, O. S.; and having, at an early age, made a considerable proficiency in mathematics, under the tuition of a schoolmaster in his native town, he was taken from school to learn the business of his father, which was that of a weaver of broad cloth. This employment, so unfitable to his faculties and views, did not restrain his ardour in the prosecution of science; and his acquaintance with astronomy was at this time so considerable, that by the help of the Caroline tables he computed eclipses of the moon and other celestial phenomena. He also contrived several kinds of dials. In his favourite pursuit he encountered many difficulties and discouragements; but devoting those hours to study, which the family spent in sleep, and reduced to the necessity of secreting a candle for this purpose, he made such progress that he was able to construct, with a common knife, an upright sun-dial of stone, which served to shew not only the hour of the day, but the rising of the sun, his place in the ecliptic, and some other particulars. This dial was placed in the front of his father’s house, and as it excited the admiration of several neighbouring gentlemen, it was the means of introducing him to their acquaintance, and of gaining for him an access to their libraries. In one of these libraries he found Martin’s Philosophical Grammar, in the perusal of which he first acquired his taste for natural philosophy. In another library he met with a pair of globes, the use of which facilitated his solution of various problems. At this time he had the happiness to be introduced to the acquaintance and patronage of the Rev. Dr. Henry Miles, a dissenting minister at Tooting, near London, well skilled in natural knowledge, and a respectable member of the Royal Society. Mr. Canton accompanied Dr. Miles to London, in 1737, and after residing with him for sometime, he articulated himself for five years as an assistent to Mr. Samuel Watkin, master of an academy in Spital-square. Having recommended himself in this subordinate situation, by his ingenuity, application, and good conduct, he was taken into partnership by Mr. Watkin in 1743, and afterwards succeeded him in his school, where he remained till his death. The science of electricity had for some time engaged the attention of Mr. Canton; and after the discovery of the Leyden Philo towards the close of the year 1745, he made it the object of his particular investigation, and in the following year his method of determining the quantity of electricity accumulated in it was communicated by Dr. William Watson to the Royal Society. His mode of doing this, as Dr. Priestley observes, in his "History of Electricity," had a near affinity to the discovery of Dr. Franklin. Towards the close of the year 1749, he assisted his friend Benjamin Robins, Esq. In his experiments for ascertaining the height to which rockets ascend, and the distance at which their light may be seen. In January, 1750, Mr. Canton communicated to the Royal Society his "Method of making artificial magnets, without the use of, and yet far superior to any natural ones." The discovery of this method had been made some time before; but Mr. Canton, from motives of delicacy, with respect to Dr. Gowin Knight, delayed the publication of it, till he was urgent to it by Martin Folkes, Esq. This communication was soon followed in the same year by his being elected a member of the Society, and by his receiving its gold medal. In this year he was also complimented with the degree of Master of Arts, by the University of Aberdeen; and, in 1751, he was chosen one of the council of the Society. On occasion of the change of the style in 1752, he gave to the earl of Macclesfield several memorial canons for finding leap-year, the dominical letter, the epact, &c. which were afterwards published by Dr. Jennings in his "Introduction to the History of the Globe." In 1752, Mr. Canton had the honour of being the first perfon in England, who, by drawing the electric fire from the clouds, during a thunder-storm, verified Dr. Franklin’s hypothesis of the similarity of lighting and electricity. In 1753 his paper, entitled "Electrical Experiments, with an Attempt to account for their several Phenomena," was read at the Royal Society. This paper, as well as another communicated to the Society in 1754, contains some curious facts and discoveries, of which an account will be given in the History of Electricity. Mr. Canton, in 1752, sent to the editor of the Lady’s Diary a solution of the prize question for that year, explaining the phenomenon of the "shooting of stars." The answer was anonymous; but Mr. Thomas Simpson, who then conducted the Diary, sent the prize to Mr. Canton, accompanied with a note informing him that, though he had concealed his name, he knew him to be the author, because no one else could have answered the question. Our author’s next communication to the public was a letter in the Gentleman’s Magazine for September, 1759, on the electrical properties of the Tournaisin, which fee. In the same year the Royal Society received a paper, entitled, "An Attempt to account for the regular diurnal Variation of the horizontal Magnetic Needle, and also for its irregular Variation at the Time of an Aurora Borealis." Mr. Canton’s observations on the transit of Venus were communicated to the Royal Society in November 1761; and in 1762, a letter addressed to him by Dr. Franklin was read, containing remarks on Mr. Delaval’s electrical experiments; in December of the same year his curious paper entitled "Experiments to prove that Water is not incomprehensible" was also communicated to the Society. See Compression. These experiments, as they refuted the famous Florentine experiment, were carefully examined, and the
conclusion deduced from them very cautiously received. They were repeated before a committee of the Society, who professed themselves satisfied with their accuracy and with the facts inferred from them; and in consequence of their report, the council unanimously voted to Mr. Canton the gold medal, which was delivered to him on the 30th of November, 1765. In 1769 our author communicated to the Society, "An easy Method of making a phosphorus, that will imitate and emit Light, like the Bolognian flow, with Experiments and Observations." See PHOSPHORUS. Mr. Canton was one of the committee of the Royal Society, who, in 1768, took into consideration the belt and the most effectual method of fixing electrical conductors to preserve the cathedral of St. Paul's from damage by lightning: and the mode which they recommended has been put into execution. Our author's last paper, addressed to the Royal Society, was read in December 1769, and contained "Experiments to prove that the Luminousness of the Sea arises from the Putrefaction of its animal Substances." Besides the papers above recited, and which have been inserted on account of their peculiar importance and utility, Mr. Canton wrote a number of others, which appeared in several different publications. The compiler of this article had the honour of intimate acquaintance with Mr. Canton for several of the last years of his life; and he can bear testimony from his own observation to the peculiar neatness and elegance of his apparatus, and to the accuracy and address with which he conducted his experiments. He can also testify with gratitude and pleasure to the urbane manners, and to the readiness with which he communicated information to all who wished to receive, and who seemed disposed to derive any advantage from it. His death, of a dropy in the thorax, probably occasioned by his sedentary and flatus habits, at comparatively the early age of 54, in March 1772, was much regretted by all who knew him, not only as it deprived them of an esteemed friend, but as his decease was no inconceivable loss to the interests of science, which he affably cultivated and improved. His wife, whom he married in 1744, and by whom he had several children, survived him. His eldest son, Mr. William Canton, succeeded him in the academy. Bing. Brit.

Canton, in Geography, a quarter of a city, considered as separated and detached from the rest.

The word seems formed from the Italian cantone, a square, flat, or corner flat.

Canton is also more frequently used for a small country, or district, under its separate government. Such are the thirteen Swiss cantons; each of which forms a republic apart; but all are leagued together, and constitute what is called the Helvetic body. See Switzerland.

Canton, in the late organization of the French constitution, denotes a subdivision of a district; as districts are subdivisions of the departments. See Department. Each canton is composed of a certain number of communes (see Communes); and is comprehended within the jurisdiction of a justice of peace. The "assembly of canton" is composed of all the citizens domiciliated within the canton, and who are in consequence upon the communal list of the district. The first consul nominates the president of this assembly, whose functions last five years; and he is affitled by four scrutineers and a secretary. Each assembly of canton divides itself into sections, for the purpose of performing the functions that belong to it; and it proposes two citizens, from whom the first consul chooses the justice of peace of the canton, and also two citizens for every vacant place of deputy. The justices of peace, and their deputies are appointed for ten years. In the cities consisting of 5000 persons the assembly of canton precursor two citizens for each place in the municipal council; and in cities, where are several assemblies of canton, each assembly is empowered in like manner to present two citizens for the same purpose. The members of the municipal councils are taken by each assembly of canton from a list of 500 persons of the first consideration of the canton; and these councils shall be renewed, one by one, every three years. The will of the citizens of the canton, who are continued five years in office, but may be rechosen. The assembly of canton nominates for the electoral college of district the number of members assigned to it, in proportion to the number of citizens of which it is composed; and it nominates to the electoral college of department, from a given list, the number of members assigned to it. The government convenes the assemblies of canton, and fixes the time of their duration, and the object of their meeting.

Canton, or Quang-chou-foo, a city and maritime port of China, and capital of the province of Quang-tong or Canton. The city and the suburbs are situated for the most part on the eastern bank of the Pe-kiang river, which communicates by canals with the neighbouring provinces. The city is composed, as it were, of three different cities, separated by lofty walls, but so connected, that the same gate serves to pass from the one and to enter into the other. These three cities united form a regular square, and the city wall is laid to be about six or seven miles in circumference; though the inclosure is occupied partly by pleasure-grounds and fish-ponds, as well as by private and public buildings. The suburbs are much more extensive. The streets are long and straight, chiefly paved with flat flones, and ornamented at certain intervals with triumphant arches; some of them are covered, and these contain the richest shops. The houes are generally low, consisting only of one story, without windows to the street; but other buildings, inhabited by the most respectable merchants and mandarins, are lofty, spacious, and convenient. Some of these are fitted up in the English manner, with glass windows and fire-grates, the latter of which are found to be useful about the winter solstice. A large garden with pools and parterres surrounds the buildings. On one side of them is a temple; and on the other, a high edifice, the top of which commands a view of the river and shipping, as well as of the city and the country to a considerable distance. Perons of condition are carried in chairs; and few females are seen in the streets. These, however, are continually crowded, especially with persons, who are all loaded, and most of whom have their heads, legs, and feet bare. There is no other convenience in this city for removing goods from one place to another but by means of porters. The quay on which the European factories are built, and which is very extensive, is situated, without the walls of the city, on the left bank of the river, and displays by flags the colours of every nation. These factories compose a long range of buildings, of one story, with several yards. From behind, they form a street, crowded with shops, which are furnished with every kind of merchandise; and the street is closed at the two extremities by barriers, beyond which the Europeans are not to pass. Formerly they went every where, except into the Tartar town, which is contiguous to the Chineese town. The number of strangers to be seen in the suburbs, while their ships are loading and unloading in the river, together with their various languages, dreeses, and characteristic deportment, would give occasion to doubt, if a judgment were to be formed from that part of the town, to what nation it belonged. The town of boats is a league above Canton. They are all in fruit rows, and form streets. Each boat, being tolerably large and covered, affords an habitation to a whole family; who have also a small boat to procure provisions,
The number of inhabitants in the town and suburbs of Canton is estimated at a million and a half; and if we consider the great extent of the city, the vast resort of trading vessels and boats, and the immense number of mechanics, tradesmen, merchants, merchants' clerks, porters, watermen, fishermen, hatmakers, and native Chinese, it will not be thought extravagant. The custom is sometimes composed of 20,000, at other times of 25,000, and even of 35,000 Tartars.

The number of persons, who are obliged to live on the water in boats, and who are prohibited by the express regulation of the law from settling on shore, may amount to 300,000, including the women of the town, who are estimated at 40,000. Canton is not only one of the best and most considerable ports of China, but it is the only one which Europeans are permitted to frequent; it is also the rendezvous of a great proportion of Chinese vessels, trading to Cochinchina, Formosa, Haynan, Siam, Malacca, Achem, Batavia, the Moluccas, Japan, &c.

The great objects of import and export are principally carried on in this city by means of agents belonging to companies in Europe. Such have been, as for G. Stanton observes, (Embassy to China, vol. ii. p. 57.) the profanity, punctuality, and credit of the English East India company in particular, and of their agents, in the estimation of the Chinese merchants, that their goods are always taken, at a quantity and quality, for what they are declared in the invoice; and the bales with their mark pass in trade, without examination, throughout the empire. These agents are divided generally into super-cargoes and writers; and they are allowed a commission on the business which they do, according to their stations in the service. The exports of Canton consist of many articles, but that which is most commended is tea; of which the Europeans and Americans received, in 1795, 5,577,800 lbs., and the English private trade amounted to 23,733,580 lbs. The exports from Canton to India amounted, in 1792, to 330,000, leaving a vast balance in favour of India, which is paid in cash. The articles purchased for India consist chiefly of raw and wrought silk, sugar and sugar-candy, tuseeag, alum, porcelain, camphor, nankeen cloth, quicksilver, and turmeric. In 1792, there were imported into Canton from England, in 16 company's ships, to the amount of near 1,000,000, in lead, tin, woollens, together with furs, and other articles of private trade.

The order for woollens only in the following year was 250,000, higher than the preceding year. The legal trade from the British dependencies in India to Canton, in 1792, amounted to very near the sum of 700,000 l.; besides opium, which is clandestinely imported there, to the amount of about 250,000. The articles legally imported consisted of cotton, silk, pepper, madder-wood, elephants' teeth, and bees' wax. The total imports from foreign European nations to Canton, in 1795, amounted to 200,000; and their exports to upwards of 600,000. Many of the imports were of British manufacture. The Canton artists are uncommonly expert in the imitation of European works. They repair, and even make watches, copy paintings, and colour drawings, with great success. They supply strangers with coarse silk rockings, knit or woven at Canton, though few or none of them are worn by the natives. The toys made at Canton, and known under the name of balancers and tumblers, are partly filled, and their equilibrium sustained, by quicksilver. The lapidaries of Canton, who cut diamonds, use for that purpose adamantine spar. The amalgama of tin and quicksilver is applied, by the artificers in Canton, in making small mirrors, with glass blown upon the spot from broken pieces of that material imported whole from Europe. The spectacles used by the Chinese are formed of crystal, which the Canton artists cut into laminae, with a kind of steel saw, formed by twirling two or more fine iron wires together, and tying them like a bow-string to the extremities of a small flexible bamboo. The siliceous powder of the crystal, procured by sawing, is received into a trough of water; and with that mixture the wire and groove formed in the crystal are often moistened. The powder of the crystal, like that of the diamond, helps to cut and polish itself. Gold leaf is used by the silk and velvet weavers in their tints and embroideries. Tinplate also are made of it at Canton, which, though not worn by the Chinese, are sold in Europe as adornments. Silver is also drawn into threads, like gold, to be used in the silk and cotton manufactures. For the method used at Canton in preparing their white copper or petung, &c. see that article.

By the accurate observations of Mr. Raper, during the year 1774, cited by Kirwan in his "Ephemer," &c. p. 97, the temperature of Canton was 75° 14'; the standard temperature 75° 4'; the greatest heat in January 66° 5', the least 51'; the greatest heat in August 89°, and the least 80°. N. lat. 23° 7' 50". E. long. 113° 2' 15".

Canton, a province of China, of which the above described city is the capital. See Quang-Tong.

Canton, a township of America, in Norfolk county, Massachusetts, incorporated in 1797; being formerly the northern part of Stoughton.

Canton, in Heraldry, is one of the nine honourable ordinaries; being a square portion of the escutcheon parted from the rest.

It has not any fixed proportion; though regularly it should be less than a quarter, it is often only a ninth part, and used as an addition, or difference, frequently to express bailiary. The canton is sometimes placed at the right corner, and sometimes at the left; in which latter case, it is called a canton saffier. For its form, see Plate, Heraldry.

Canton is also used for the spaces left between the branches of a crook or sallier.

To Canton, or dispose of in cantonments, in French cantonnement, in the Military Art, is to distribute troops in towns and villages as contiguous to one another and as nearly in the same line as possible, and in such a manner as to command the avenues to the same, and to front the district of country the enemy is in, or the towns, villages, posts, or positions, he may occupy or poffefs himself of. Troops are sometimes cantonned after the fatigue of a siege, that has been undertaken early in the spring, that they may have some time to reposie and recruit themselves; sometimes in the midst of a fatiguing campaign, for the purpose of rest and refreshment; sometimes towards the close of a campaign, when forage is scanty and the weather tempestuous, till such time as the enemy shall go into winter quarters; and sometimes before the opening of an early campaign for the fake both of subfitude and of convenience to a proper or eligible camp of exercise, which is at all times within reach of their cantonments, and can be protected from them.

The cantonning of troops is also a phrase occasionally, though not very properly, made use of for the disposing or distributing of troops into winter quarters. See the article Quarters. In a garrisoned town or place, where there is not a sufficiency of barracks and cafemats for the troops, different divisions of it are allotted to different regiments for the accommodation of their officers and men. And such an allotment or division of the town, is sometimes called the cantonning of it.

CANTONE, in Commerce, a measure of three gallons, wine-measure, at Alicante.

CANTONED, a word used in Architecture, when the
corner of a building is adorned with a pilaster, an angular column, buffle quoin, or any thing that projects beyond the naked of the wall.

**CANTONED, CANTON'S, or CANTONIZED, in Heraldry,** is when the four cantons, or spaces round a cross, or faltier, are filled up with any pieces.—He bears gules, a cross argent, cantoned with four scallop shells.
The word is also used when there are little pieces in the cantons, or spaces, of any principal figure of an effigio.

Thus the faltier of Lenox is cantoned with four rosettes.

**CANTONING, in Middle Age Writers,** denotes the dividing a thing into hundreds, or filling it by hundred weights, or hundreds in tale.

**CANTONMENTS, in Military Art,** are a fort of transient or temporary quarters for different purposes, but chiefly for the repos of troops. Cantonments differ from quarters in this respect, that the latter are seldom made use of but for a short rest or refreshment to an army that is much fatigued, but continues to do the same fort of duty in them as in the field; whereas in the latter, duty is performed as in garrisoned places.

In quarters of cantonment, the troops ought to be arranged and disposed of nearly in the same manner as in order of battle; viz., with the cavalry on the wings and the infantry in the centre. The cantonments should not be very much scattered or extended. They ought not to exceed ten or twelve leagues in front, or be more than four or five in depth.

Before you take the field, they should be a little contracted, and then divided or disposed of under the command of five or six of the oldest generals. One of these should command the cavalry of the right wing, another that of the left, and the rest the infantry in the centre. By such a division or disposition, all orders from the commander in chief will be the more expeditiously executed, and the troops will with greater ease form their columns when they are going to take the field.

**CANTOR, in Entomology,** a species of Cerambix, found in China. The thorax is unarmed, cineereous, with black dots; wing-cages pale, tetaceous; bidentated at the tip, and cineereous with black spots. Fabricius.—Obf. This is of the middle size, and vitlike.

**CANTORS, Lat., a finger, a chanter.** In the Lutheran church, the cantor is the coryphæus of the psalmody. In most parts of Germany, where the protestant religion is established, each parish has a cantor to teach singing, and to direct the choir.

Though cantor is a general appellation for a singer, it is in a particular manner applied, in this country, to the person who has the direction of singing the psalms and hymns in parish churches. He is precentor, or leader of the plain, which he likewise ends, by singing the last word of every line; so that he may be called the alpha and omega of sacred song.

The cantor, who is likewise frequently schoolmaster, besides having a good voice, should necessarily understand counterpoint; if not in a high degree, at least sufficiently to correct such errors as may have crept into compositions, through the ignorance or carelessness of transcribers. He should likewise be able to make an accurate score, and from the score to figure the bass, in such a manner as to include all the accidents of modulation. "Without these qualifications," says Mr. Walther, in his Musical Lexicon, "as a German organist is not gifted with universal knowledge, no perfect harmony can be hoped."

In the market towns and villages of Thuringia, in Saxony, where two persons are usually employed in a school, he who directs the music in the choir, or leads the psalm or chorus, is called rector or schoolmaster, and the organist is commonly cantor.

**CANTRED, or CANTREE, denotes a district or division of an hundred towns or villages.** The word is British, compounded of cant, hundred, and tre, or tref, town or village.

Wales, with regard to its lesser divisions, seems to have been originally divided into "bôds," "trews," and "caers." The "bôd" is supposed to have been the manor-house of a chiefman on his hill settlement in the country; the lands which he alligned for the maintenance of his dependants in the increasing colony were called a "trew;" and the inclusion of such lands for defence or convenience, formed either of wood or stone, might have been denominated a "caer."

An affenblage of several "bôds," formed a "trew" or township; and a hundred of these "trews" constituted a "cantrew." For the more easy and regular dispatch of business, a "cantrew" was divided into two or more "commots;" each of which consisting of a certain number of "bôds" and "trews" formed a distinct precinct, and was considered as a lordship, possessing a separate court and jurisdiction.

Anglesey, in particular, was divided into three "cantres" or "cantreds," which are each subdivided into fix "commots" or "commotes," each of "commotes" containing about sixty "treves" or townships.

The general partition of Wales into "cantrews" and "commotes" is very ancient. Rowl. Monum. Ant. Eff. § x. p. 110, &c.

CANTU, in Geography, a town of Italy, in the Milanese; 5 miles S.S.E. of Como.


Sp. i. C. perfusilis, Lam. Ill. pl. 105. fig. 1. "Flowers terminal; flaments longer than the corolla; leaves egg-shaped, petiolate, entire, smooth." Willd. A shrub, smooth in all its parts. Branches woody, thick, stiff, marked with scattered tubercles or knots. Leaves an inch and a half long, and near an inch broad; alternate; petioles short, proceeding from the tubercles. Flowers peduncled, in terminal racemes; calyx often three-eleft, and divided more deeply on Pide. Found in Peru by Joseph de Jullieu. 2. C. bustifolia, Lam. Ill. pl. 105. fig. 2. "Flowers terminal; flaments shorter than the corolla; leaves oblong, nearly falcate, entire, pubescent beneath." Willd. A shrub. Branches woody, rather cylindrical, pubescent towards their summit. Leaves small, about six lines long, and little more than two broad, alternate or falcate-lacinate, lanceolate-egg-shaped, entire. Flowers large, peduncled, upright; peduncles and calyx pubescent; corolla tubular, an inch and half long. Found in Peru by Joseph de Jullieu. 3. C. Hoit-zi, Willd. (Hoitzia mexicana; Lam. Eneey. Juss.) "Flowers axillary; flaments longer than the corolla; leaves 8—12—18-veined."
egg-shaped, fleshy, toothed." Willd. Stem a little shrubby; branches slender, cylindrical, pubescent, especially near their summit. Leaves alternate, entire near their base, a little divided underneath. Flowers of a fine red colour, solitary, nearly fleshy, on the upper part of the branches; segments of the calyx acute, bracteate, of a little longer than the calyx, and surrounding it in the form of an exterior calyx, fleshy, toothed, and terminated by a spinous point; tube of the corolla four or five times longer than the calyx, slightly curved. Fruit not known. A native of Mexico. Willdenow justly observes that as it differs from Cantua only in its bractes, it ought not to constitute a distinct genus. 4. C. pinnatifida. "Lam. Ill. (c. coronopifolia, Willd. Po- lemonium rubrum, Linn. Sp. Pl. Iponcra rubra, Syl. veg. Qaimoebil pinnatum erectum, Dill. Eth. tab. 241. f. 53. 57.) "Flowers terminal; flameus the length of the corolla; leaves pinnatifida." Stem somewhat shrubby, upright, not milky. Tube of the calyx short; segment of its border awl-shaped, longer than the tube. Stamens inserted into the middle of the tube of the corolla without valves. A native of fandy foil in Carolina. Four other species are figured by Ruiz and Pavon in the Flora Peruviana, and three more by Cavalliales in his Icones Plantarum. CANTWELL, Andrew, in Biography, born at Tipperary in Ireland, but lived principally in Paris, where he was made doctor in medicine in 1742. The same year he published a translation into French of the account of Mrs. Stephen's medicine for dissolving the stone in the bladder; and in 1756 an account of Dr. Hans Sloane's medicines for diseases of the eyes; also some severe strictures on the practice of propagating the small pox by inoculation; and in the Philosophical Transactions, London, No. 453, an account of a double child, a boy. He died at Paris, July 11, 1764. Haller. Bibl. Anat. Ecol Dict. Hist. CANTY BAY, in Geography, sometimes called New bay, lies on the coast of Java in the East Indies, and is formed by an island of the same name. It furnishes the best accommodation for wooding and watering in their seas. CANTYBRE. See CANTRE. CANYAS, or CANSAS, in Commerce, a coarse sort of linen or hempen cloth, usually woven open, and regularly, in little figures, serving for divers domestic purposes, and especially for the ground of tapestry work and painting. We have divers sorts and denominations of canvas, most of them imported from abroad; as Dutch, Barbars, and Holmi canvas; packing canvases; goutines and spruce canvas; polichov, itching, or Queensborough canvas; working canvas, for botts or cushions, narrow, broad, and brocked. Canvas also is the cloth on which painters usually draw their pictures; the canvas being smoothed over with a flock, then sized, and afterwards whited over, makes what the painters call their primed cloth, on which they draw their first sketches with a coal or chalk, and afterwards finish with colours. Canvas also is a name sometimes given to fail cloth. Canvas-lace, in the Military Art, contain about a cubic foot of earth or sand, with which they are filled. Their use is to raise a parapet in halte, or to repair one when beaten down. See Sacks of earth. Canvas is also used among the French, for the model or first words, whereon an air, or piece of music, is composed, and given to a poet to regulate and finish. The canvas of a long contains certain notes of the composer, which fiew the poet the measure of the verses he is to make. Thus Du Lort says, he has canvas for ten follettens against the Macks. CANUCCIS, in Ancient Geography, the station of a Roman colony in Africa, planted there by Aurelius, about 7 miles W. from Juf; the Guum of Probity, and Gomagus of the Itinerary, and corresponding to the Lucchi of the Agamemnon. See BRASS. CANVEY, in Geography, a small island in the mouth of the Thames, near the coast of Essex, about 5 miles long and 2 wide; high tides often overflow the lowet parts of it. 5 miles N.W. from the North. CANTULA. See CANULA. CANUS, in Zoology, a South American species of Vole, distinguished by having 158 abdominal plates, and 70 caudal scales. Linn. Muf. ad Fr. This name is debited to Boldmatt as being of a hoary colour, with large whitish spots disposed separately, with a fowy white spot between each. The mount is obtuse and rounded; head imbricated with scales. It is conceived that this species ought to be considered as a connecting link between the two genera Bua and Coluber. CANTUSIUM. See CANTUS. CANUTE, termed "The Great," in Biography, king of Denmark and England, succeeded his father Sweyn in the first kingdom, about the year 1014; and commenced his reign with the invasion of England and Norway, both which kingdoms had revolted from his father. England, however, was his principal object; and as the English had recalled Ethelred their king, who had abdicated the throne, he was not unpre- parative that this event might lead to an attempt for rendering him independent of the crown of Denmark. Accordingly he prepared for an invasion of the kingdom, and soon appeared with a fleet off the eastern coast, which he ravaged with merilis fury; putting ashore all the English hostages at Sandwich, after having cut off their hands and noes. His absence, however, had afforded Olaus king of Norway an opportunity of invading his kingdom, and he was under a necessity of returning home in order to check his progress. This enterprise having been completely accomplished, he resumed his attack on England, and made great depredations on the southern coast, where an army was assembled against him, under the command of prince Edmund and duke: Edric, the son-in-law of Ethelred, who was a notor- ious traitor. Edric still continued his perfidious machinations; and after endeavouring in vain to get the prince into his power, he found means to disperse the army; and he then openly defied to Canute with 40 vessels. When prince Edmund, called "the Iron"; succeeded his father Ethelred, he contended gallantly against Canute and his confederates; but after the loss of two battles, occasioned chiefly by the fallacy and treachery of Edric, he was obliged to acquiesce in a treaty, which divided the kingdom between him and Canute. The latter referred to himself the northern division, consisting of Mercia, East Anglia, and Northumberland, which he had entirely subdued; and the southern parts were referred for Edmund. This prince survived the treaty about a month; and his murder, by the accomplices of Edric, made way for the succession of Canute to the crown of England, A.D. 1017. Against his valour and activity and the strong force which he commanded, the two sons of Edmund could make but an ineffectual reftistance; however, Canute, before he feized the dominions of the young princes, summoned a general assembly of the states in order to secure to himself the succession of the kingdom. In order to maintain the unoffended possession of the throne, he gratified some of the nobility with extensive governments and juridiction, and others, on whose fidelity he could not rely, he put to death. Among the latter was the perfidious Edric. His Danish followers were liberally recompened by means of the heavy taxes which were
were laid on the people, and particularly on the inhabitants of London, who were thus retaliated for their affection to Edmund and their reliance to the Danish power in two obstinate sieges. In one of these sieges he diverted the course of the Thames, and thus by a new channel brought his ships above London-bridge. Canute, having by the concurrence of art and power established himself upon the throne, determined, with the fonnded policy, to reconcile his English subjects to the Danish yoke, by the justice and impartiality of his administration. Accordingly, he went back to Denmark as many of his followers as he could spare; he restored the Saxon customs in a general assembly of the states; he made no division between the Danes and English in the distribution of justice; and he took care by a strict execution of law, to protect the lives and property of all his people. In process of time the Danes were gradually incorporated with his new subjects. For the greater security of his government he contrived to remove the two fons of Edmund to Hungary; and, to conciliate the Normans, who cpiioned the case of Alfred and Edward, the sons of Ethelred, he married Emma, the mother of these princes and the sister of Richard, Duke of Normandy.

Canute, having settled his power in England beyond the danger of a revolution, made a voyage to Denmark, for the purpose of refilling the attacks of Oifmund, king of Sweden; and in this expedition he was accompanied by a great body of the English, under the command of the earl Godwin. The earl, by his skill and valour, contributed to the total dilcomfiture of the Swedish army, and so effectually recommended himself to Canute, as not only to obtain his daughter in marriage, but to lay the foundation of that immense fortune which afterwards accrued to his family. Canute, availling himself of this advantage, puffed with such celerity to Schon, that he surprized the enemy, and flew in battle the king of Sweden. In another voyage, which he made afterwards to Denmark, he attacked Norway, and expelling the julf, but unwarily Olau, kept possession of his kingdom till the death of that prince. Canute was now one of the most powerful sovereigns in Europe; extending his empire over Denmark, Norway, and England, and having rendered Sweden tributary. But neither the elevation of his rank, nor the extent of his dominion, could bound the grasp of his capacious and aspiring mind. Experience taught him the unsatisfactory nature of all terrestrial enjoyments; and he began to direct his views towards that future existence, which it is so natural for the human mind, whether fatigued by prosperity or disfigured with adversity, to make the object of its attention. The spirit of the age in which he lived, however, gave a wrong direction to his devotion; and instead of making compilation to those whom he had injured by his former acts of violence, he employed himself entirely in those exercises of piety, which the monks represented as the most meritorious. He built churches, endowed monastery, enriched ecclesiastics, and bestowed revenues for the support of chantries in various places, where he appointed prayers to be said for the souls of those who had there fallen in battle against him. He even undertook a pilgrimage to Rome, where he refided a considerable time, and where he obtained from the pope some privileges for the English schools erected in that capital, and exemptions from those impositions and tolls which the English pilgrims had been accustomed to pay in the countries through which they passed. It is natural to imagine that a sovereign, so prosperous and powerful, should meet with adulation from his courtiers. A singular, but well known, instance of this kind occurs in the calce of Canute. Some of his flatteners, when they were one day expressing their admiration of his grandeur and dominion, said to him, that nothing was beyond the reach of his power: upon which the monarch, it is said, ordered his chair to be set on the sea-shore, while the tide was rising; and as the waters approached, he commanded them to retire, and to obey the voice of him who was lord of the ocean. He feigned to sit some time in expectation of their submition; but when the sea still advanced towards him, and began to wash him with its billows, he turned to his courtiers, and remarked to them, that every creature in the universe was feble and impotent, and that power refided with one being alone, in whose hands were all the elements of nature; who could say to the ocean, "Thus far shalt thou go, and no farther;" and who could level with his nod the most towering piles of human pride and ambition. The only memorable action which Canute performed, after his return from Rome, in 1031, was an expedition against Malcolm, king of Scotland, who had refused to render him homage for the county of Cumberland, which he held as vaffal to the crown of England. Upon his appearing on the frontiers with a formidable army, Mal-colm submitted, and agreed, that his grandson and heir, Duncan, whom he put in possession of Cumberland, should make the submitions required, and that the heirs of Scot-land should always acknowledge themselves vassals to Eng-land for that province. After this enterprize Canute passed four years in peace, and died at Shaftesbury, in 1035; leaving three fons, Sweyn, Harold, and Hardicanute, and appended, by his will, Harold successor to the English crown. Mod. Un. Hist. vol. xxviii. p. 429. Hume's Hist. of Eng-land, vol. i. p. 143-154.

CANUTI Avis, in Ornithology, tringa canutus; our common knot is so called by some old writers.

CANUTUS, in Ornithology, a species of Tringa, known in this country by the name of knot. It is a native of various parts of Europe, and of America. The bill is smooth; legs inclining to ash colour; primary quill feathers ferrated; outermost tail-feathers white, and without spots. F. Suec. Brinnich, &c.

The bill of this bird is dusky ash-colour; irides hazel; lores dusky; eye-brows and band on the wings white; body cinereous above, beneath white; lower wing-coverts tipt with white; chin and breast with minute spots; belly and vent with dusky lines.

Canutz, a species of Tringa, with smooth bill; legs inclining to ash-colour; primary quill feathers ferrated, exter-ior tail feathers white and without spots. F. Suec. Obs. This is the knot of English writers, Canutus of Bril-lon, and Canut of Buffon. Inhabits Europe and America. Length nine inches; flesh excellent.

Cany, in Geography, a town of France, in the depart-ment of the Lower Seine, and chief place of a canton in the district of Yvetot; the place contains 1435, and the canton 12157 inhabitants; the territory includes 1771 kilometres, and 23 communes. The adjacent country produces great quantities of corn and flax. N. lat. 49° 48'. E. long. 1° 32'.

Cany Ford, a river of America, in the state of Tennes-see, which is short and navigable, and runs N. W. into Cumber-land river, W. of the Salt-lick and opposite salt-lick creek, 50 miles in a straight line from Nashville.

Canytis, in Ancient Geography. See Catytis.

Canzone, an Italian lyric poem in regular stanzas, for which Dante has given precepts and established the laws. The canzonet of Petrarch, and the old poets seem to want variety of measure, and to be too long ever to have been intended for music.

Canzonetta, is the diminutive of canzone, a short lyric poem, and always intended for music.
CANZURI, a name given by some authors to a peculiar kind of cannabis more esteemed than any other sort. Some have suspected it thus called from Kunzur or Chuanur, the name of a place where they suppose it to be produced, which forms the more probable opinion, though Scaliger rejects it. See CANDERBURY.

CAO-CHAN, in Geography, a town of Aifa, in the kingdom of Corea; 30 miles E.S.E. of Hettin.

CAO-CHAN-LI, a town of Aifa in Corea; 400 miles E. of Peking.

CAOINAN, the name given to the funeral song of the Irish. Mr. Beauford (Irish Trans. Vol. IV. p. 46, &c.) has presented to the curious a specimen of this song, with the words in Irish and English, set to musical notes, with its full choruses of sighs and groans, and burden of ullala lollal lollal. He has also prefixed a brief account of the modes of lamentation, by bowls, gYeulures, and ceremonies, which have prevailed, and which still, in a degree, prevail in Ireland. He supposes them to have been derived from the prehistoric inhabitants of Ireland, of Celtic race. Thefe, he says, were a timorous and unwarlike race, as their military weapons, and every vellige of their cuumions and manners strongly indicate: their religion also was spiritual and unattended with human blood. Such a religion and such manners imply a susceptibility of tender impressions, and feminine expressions of sorrow. Accordingly, it has been affirmed of the Irish, that to cry was more natural to them than to any other nation, and at length the Irish cry became proverbial. Cambrensis, in the 12th century, informs us, that the Irish then musically expressed their grief, or applied the musical art, in which they are said to have excelled all others, to the orderly celebration of funeral obsequies, by dividing the mourners into two bodies, each alternately finging their part, and the whole, at times, joining in full chorus. This antiphonial finging is said to have been coeval with Christianity in this isle. See AANTHONY. It was then the funeral elegy rofe in poetic numbers, and was fing in poetic accents to the sound of musical instruments. After the body of the deceafed, dressed in grave cloths, and ornamented with flowers, was placed on a bier, or some elevated spot, the relatives and "Keeners" ranged themselves in two divisions, one at the head and the other at the feet of the corpse. The funeral caonian having been previously prepared by the bards and "crooters," the chief bard of the head chorus began, by finging the firft flanza in a low doleful tone, which was softly accompanied by the harp; at the conclusion, the foot feimi-chorus began the lamentation of "ullaloa," from the final note of the preceding flanza, in which they were anfwered by the head feimi-chorus; thefe both united in one general chorus. The chorus of the firft flanza being ended, the chief bard of the foot feimi-chorus fung the fecond flanza, the strains of which was taken from the concluding note of the preceding chorus; which ended, the head feimi-chorus began the fecond "gol" or lamentation, in which they were anfwered by that of the foot, and then, as before, they united in the general full chorus. Thefe alternately were the fong and choruses performed during the night: the genealogy, rank, poftsfeions, virtues, and vices of the dead were reheafed; and various interrogations were addreffed to the deceafed. Each verfe of the Caonian, it is said, conftituted only of four feet, and each foot was common of two syllables; the three firft required no correpdcence, but the fourth was to correpond with the terminations of the other verses. This kind of artificial metre was much cultivated by the Irish bards; but, on the decline of that order, the caonian was allomned by women, and became an extempormeous performance. Each province was supposed to have different caonians, and hence the Munster cry, the Litter cry, &c., are the only distinct imitations of the different choruses of the same caonian, independent of provincial distinctions. As the caonian was long extemporal, and had no genuine established time, each set of "Keeners" varied the melody according to their taste and musical abilities, carefully preferring, however, the subject or burden of the song throughout, both in the vocal and instrumental part; as begun by the leading "Keener." The caonian is at present much neglected; and this ancient custom will probably soon cease; English manners and the English language supplanting that of the aboriginal natives. At the conclusion of the "Keenan," the body was conveyed to the place of interment, attended by the friends and relatives of the deceafed, and accompanied by the cries of women, who at certain intervals sung the "goll" or "ullaloa." In ancient times, after the interment, the favourite bards of the family, seated on the grave or funeral, performed the "comin- thal" or elegy; which they repeated every new and full moon, for the first three months, and afterwards generally once every year, for perfections of dilution. The elegy was more regular than the "keenan," both in respect to its poetical composition and concluding cadence. The families, both in Wales and Ireland, retained this custom to the close of the last century, and it is frequently alluded to in the Irish ballads and pastoral romances.

CAO-LIM, in Geography, a town of Aifa in Corea; 500 miles E.N.E. of Peking. N. lat. 43° 40'. E. long. 122° 5'.—Alio, a town of Chinese Tartary. N. lat. 45°. E. long. 123° 54'.

CAO-MING, a town of China, of the second rank, in the province of Yunnan. N. lat. 25° 22'. E. long. 102° 44'.

CAO-TANG, a town of China, of the second rank, in the province of Chantong; 200 miles S. of Peking. N. lat. 36° 78'. E. long. 115° 54'.

CAO-TECHIN, a town of China, of the third rank, in the province of Pet-cheli; 15 miles E.S.E. from Tchenting.

CAO-Y, a town of China, of the third rank, in the province of Pet-cheli; 30 miles S. of Tching.

CAO-YAM, a town of China, of the third rank, in the province of Pet-cheli; 12 miles S. of Gan.

CAO-YANG, a town of Aifa, in the kingdom of Corea; 7 miles N.W. of King-kitafu.

CAO-YUEN, a town of China, of the third rank, in the province of Chang-tong; 42 miles N.W. of Tchin-tchen.

CAORLO, a town of Italy, on an island of the same name, in the gulf of Venice, near the coast of Friuli; the see of a bishop, suffragan of Venice. N. lat. 43° 54'. E. long. 12° 44'.

CAOUANNA, in Zoology, Caouanne of Ray; oedou varicata, a modern naturalist, and logger-headed turtle of Cateby. The flesh of this species is highly rancid, hard, tough, and frivolous. See TESUDO CEITTTA.

CAOUKE, in the Turkish Drefs, a high fliff turban, worn by the odabachees, or heads of the chambers of janizaries, when they go in procession.

CAOUTCHOU, Elaflu Gum, in ChemistrY. This fingular vegetable substance was firft brought to Europe from South America, about the beginning of the last century. Nothing however was known concerning its natural history till a memoir was presented in 1736 to the French academy by Con- daime, in which it is stated, that there grows in the province of Eimeraldas in Brazil, a tree called by the natives "Hhevé," from
from the bark of which, when wounded, there flows a milky juice, which by exposure to the air, is converted into caoutchouc. Some time after, the same tree was found in Cayenne by M. Freneau; and it appears from later researches, that this singularly elastic substance is procured from at least two trees natives of South America: of these, the one is called by botanists laevis caoutchouc, and the other, jatrophis caoutchouc. The American caoutchouc is usually brought to Europe in the form of globular narrow necked bottles, about a fourth of an inch thick, and capable of holding from half a pint to a quart or more. They are formed upon moulds of unburnt clay, pieces of which are often found adhering to the inside. In its native country it is fabricated by the inhabitants into vessels for containing water and other liquids, and on account of its inflammability, it is used at Cayenne for torches.

In the Atlantic researches is an account by Mr. Howison, surgeon at Pulo Penang, of a substance exhibiting all the properties of caoutchouc, procured from the juice of a climbing plant, the urceola caoutchouc, a native of that small island, and the neighbouring coast of Sumatra. If one of the thicker and elder items of this plant is cut into, a white juice oozes out, of the confession of cream, and thinly pungent to the taste. By exposure for a short time to the air, or fill more expeditiously by the addition of a few drops of acid, a decomposition takes place; the homogeneous thick cream-like juice, separates into a thin whitish liquor, resembling whey, and the caoutchouc concretes into a clot or curd, covered superficially with a thin coating of a butteraceous substance. If the juice as soon as secreted is carefully excluded from the air, it may be preserved for some weeks without any material change, but at length the caoutchouc separates from the watery part in the same manner, though not so perfectly as it does by free exposure to the air. The proportion of caoutchouc contained in the juice by the oldest items, is nearly equal to two thirds of its weight; the juice from the younger trees is much more fluid, and contains a considerably smaller proportion of this substance.

According to the experiments of Mr. Howison, cloth of all kinds may be made impregnable to water by impregnating it with the fresh juice of the urceola; and the pieces thus prepared are most effectually and expeditiously joined together by moistening the edges with the entire juice, or even the more watery part, and then bringing them in contact with each other. Boots, gloves, &c., made of this impervious cloth are preferable even to those formed of pure caoutchouc, as they are more durable and retain their shape better. If a sufficient quantity of this juice could be obtained, it might no doubt be applied to a vast variety of important purposes.

The colour of fresh caoutchouc is yellowish white, but by exposure to the air it becomes of a smoky grey. American caoutchouc, in the flake in which it is brought to Europe, being formed of a multitude of extremely thin layers, each of which is exposed to the air for some time in order to dry before the next is laid on, is of a yellowish smoky colour throughout, but masses of East Indian caoutchouc being formed more expeditiously, are dark-coloured only on the outside; when cut into, they are of a very light brown, which however soon deepens by the action of the air. Caoutchouc is perfectly tasteless, and has little if any smell, except when it is warmed; it then gives out a faint peculiar odour. The elasticity of this substance is very remarkable, and is one of its most characteristic properties. Strips of caoutchouc when softened by immersion for a few minutes in boiling water, may be drawn out to seven or eight times their original length, and will afterwards resume very nearly their former dimensions. During its extension, a very sensible warmth is produced, as may be perceived if the piece is held between the lips; and on the contrary, when it is allowed to contract, a decrease of temperature will immediately take place. By successive extensions and contractions, especially in cold water, its elasticity is much impaired; but if in this state it is immersed for a time in hot water, it absorbs the caloric which it had lost, returns to its original size, and recovers its primitive elasticity. At the temperature of about 40° Fahr. caoutchouc begins to grow rigid; its colour becomes much lighter, and it is nearly opaque, and as the cold increases, it becomes still more stiff and harder. These changes, however, depend merely on temperature, for a piece of hard frozen caoutchouc again resumes its elasticity on being warmed. The fresh cut surfaces of this substance will unite together by simple contact, and by a proper degree of pressure, may be brought to completely in union so as to be no more liable to separate in this part than in any other. Its fp. gr. according to Briffon is 0.935. It undergoes no alteration by the action of the air at the common temperature. When boiled for a long time in water it communicates to this fluid a peculiar smell and flavour, and in so far softened by it, that two pieces thus treated, and afterwards strongly pressed, will form a permanent adhesion to each other.

When heated to a temperature nearly equal to that of melting lead, caoutchouc runs into a black viscid fluid of the consistence of tar, which does not concret on cooling, neither does it dry by long exposure to the air. When held to a candle it readily takes fire, and burns with a copious white flame, and a large quantity of dark coloured smoke, exhalmg at the same time a peculiar, but not unpleasant odour: from its smoke a considerable quantity of very fine lamp-black may be collected. In dry distillation it gives out ammonia and carbonated hydrogen.

Concentrated sulphuric acid, when heated, acts with great energy on caoutchouc, reducing it to a black friable carbonaceous substance, the acid at the same time being in part decomposed, and sulphuric acid being produced. When treated with nitric acid, azotic gas and carbonic and phosphoric acid are detached, caustic acid is left in solution, and the residue is converted into a yellow friable mass. By digestion in oxymuriatic acid the colour of caoutchouc is discharged, it becomes opaque, indurated, and wrinkled, like tanned leather, but appears to undergo no other change. Similar effects are produced, though more slowly, by muriatic acid.

Ammoniacal gas, according to Dr. Thomson, is absorbed by caoutchouc, and converts it into a soft, glutinous, and incalculable substance. The same able chemist also states, that the caustic fixed alkalis are capable of combining with, and dissolving it. Caoutchouc is also soluble with ease at a boiling heat in the expressed vegetable oils, in wax, butter, and animal oil, forming viscous inelastic compounds. Alcohol appears not to have the smallest action on it either cold or hot.

Rectified oil of turpentine, at the common temperature, acts without difficulty on caoutchouc, first rendering it transparent, and embrittling its bulk considerably, and in the course of a few days, effecting a complete solution. This compound is of the consistence of drying oil, and when spread thin on wood, it forms a varnish which however is a long time in becoming quite dry. When mixed with a solution of wax in boiled linseed oil, it composes an elastic varnish which is used for covering balloons.

The only menstrua for this substance, from which it can
can be separated again unaltered, are ether, naphtha, and camphor oil.

The solubility of caoutchouc in ether was first discovered by Martin, a circumstance which from its frequent发生 in the hands of other chemists, was very generally called in question, till Cavalli cleared up the difficulty by showing the necessity of employing warmed ether for this purpose. If rectified sulphur ether is taken in a vessel with pure water, it dissolves about a tenth of its weight of this latter substance, and in this state is capable of effecting a complete and speedy solution of caoutchouc. The solution is of a light brown colour, and when saturated, is considerably vitrified. A drop of it let fall into a cup of water immediately extends itself over the whole surface; and the ether being partly absorbed by the water, and partly evaporated, the water is found covered with an extremely thin film of caoutchouc, posseSSing its elasticity, and all its other characteristic properties. A similar effect takes place when cloth of any kind is soaked in the solution, or any hard surface is inclosed over with it; on exposure to the air the ether is rapidly evaporated, and the caoutchouc which it was combined with is left behind. The affinity of this solution for caoutchouc is very great; if the edges of two pieces of caoutchouc are dipped in it and immediately brought in close contact with each other, as soon as the ether is evaporated, they will be found to be perfectly united. There are two circumstances which must always prevent the extensive use of the etherous solution of caoutchouc, admirably qualified as it is in other respects for many useful purposes; these are, first, its expensiveness, and secondly, the extraordinary rapidity with which the ether evaporates; thus rendering it impossible to lay an even coating of this varnish on any surface, and clogging up the brushes by which it is applied. In order to form tubes or catheters of this substance, the best method is to cut a bottle of caoutchouc in a long fipple, and soak it for half an hour or an hour in ether; by this means it will become soft and tenacious, and if wound destitute on a greased cylinder, bringing the edges in contact with each other at every turn, and giving the whole a moderate and equal pressure by binding it with a tape wound in the same direction as the caoutchouc, a very efficient union will be produced; after a day or two, the tape may be taken off and the cylinder of caoutchouc may be rendered still more perfect by pouring a little of the etherous solution into a glass tube closed at one end, the diameter of which is a little larger than that of the cylinder of caoutchouc; which being introduced into the tube, will force the solution to the top of the vessel. Let the whole of the apparatus be then placed in boiling water; the ether will be evaporated, and a smooth and uniform coating of newly deposited caoutchouc will remain upon the cylinder.

Petroleum when rectified by gentle distillation, affords a colourless liquid not to be distinguished from the purest naphtha, and this, according to Fabbroni, has the property of dissolving one twenty-sixth of its weight of caoutchouc, and of depositing it again unaltered by spontaneous evaporation. It does not appear, however, that this menstruum has been much employed.

The solubility of caoutchouc in caustic oil was first noticed by Dr. Rosburgh. This is an essential oil procured in India, by distillation, from the leaves of the Melocanna cucumis. The solution is very thick and glutinous; and is decomposable by alcohol, this latter uniting with the essential oil and leaving the caoutchouc floating on the liquor in a soft semifluid state. This on being washed with alcohol, and exposed to the air, becomes as firm and elastic as before it was dissolved; while in the intermediate state between fluid and firm, it may be drawn out into long threads, resembling in the pulpit of their forces. The fuses of the tissues of animals, and to extremely elastic. When broken, each end immediately returns to its respective parts. Through these fuses the blood circulates with the finger and thumb is capable of uniting different portions as completely as if they had never been separated, and that without any clamping or locking to the finger.

The use to which caoutchouc has been hitherto applied, are the following. It is chiefly used for rubbing out blacklead-pencil marks from paper, whence it undergoes the Indian rubber; it is of value to the chemist as a means for flexible tubes to gaugemeters and other apparatus; the Surgeon is indebted to it for flexible lyes and catheters; and finally it enters as an essential ingredient into the composition of the bell varnish for balloons.

Caoutchouc Vene in Botany, a species of Uncaria, which see.

CAP, a garment serving to cover the head, and made nearly of its figure.

The era of caps and hats is referred to the year 1429, the first seen in these parts of the world being at the entry of Charles VII. into Rouen; from that time they began, by little and little, to take place of the hoods or chaplets, which had been used till that period. M. le Gendre, lord of, goes farther back; they began, says he, under Charles V. to let fall the angles of the hood upon the shoulders, and to cover the head with a cap, or bonnet: when this cap was of velvet, they called it motte: when of wool, simply motte: the first was laced, the latter had no ornament. Besides two horns, raised to a moderate height, one of which served in covering and uncovering. None but kings, princes, and knights, were allowed the use of the motte.

The cap was the head-dress of the clergy and graduates. Paquier says, that it was anciently a part of the hood worn by the people of the robe; the skirts whereof being cut off, as an incumbrance, left the round cap an easy commodious cover for the head; which round cap being afterwards assumed by the people, those of the gown changed it for a square one, first invented by a Frenchman, called Patrouillet; he adds, that the giving of the cap to the students in the universities, was to denote, that they had acquired full liberty, and were no longer subject to the rod of their superiors; in imitation of the ancient Romans, who gave a pilus, or cap, to their slaves, in the ceremony of making them free: whence the proverb, Pucare feres ad plenum. Hence also on medals, the cap is the symbol of liberty, whom they represent holding a cap in her right hand, by the point. When this cap was exposed to the view of the people, on the top of a spear, as in the case of the conspiracy which had occasioned the death of Caesar, it was intended as a public invitation to the people, to embrace the liberty that was offered to them by the destruction of their tyrant. This thought of the conspirators on occasion of this event, was not new; for Socrates, in his education, when he had professed himself of the Capitol, exacted a cap on the top of a spear, as a token of liberty to all the slaves, who would join with him; and though Marius, in his sixth consulship, destroyed him for that act, by a decree of the senate, yet he himself used the same expedient afterwards to invite the slaves to take arms with him against Sylla, who was marching with his army into the city to attack him. Val. Max. viii. 6.

The Romans were many ages without any regular covering for the head: when either the rain or sun was troublesome, the lappet of the gown was thrown over the head; and hence it is that all the ancient statues appear bareheaded, excepting sometimes a wreath, or the like. And the same usage
usage obtained among the Greeks, where, at least during the heroic age, no caps were known. The torts of caps or covers of the head in use among the Romans on divers occasions, where the *plura*, *pileus*, *cocculus*, *galeus*, and *pallium*, the differences between which are often confounded by ancient as well as modern writers.

The French clergy wear a shallow kind of cap, called the *claret*, which only covers the top of the head, made of lether, linen, worsted, or other stuff. The red cap is a mark of dignity allowed only to those who are raised to the cardinalate. The secular clergy are distinguished by black laiteron caps, the regulars by knelt and wrought ones.

The Chinese have not the use of the hat, like us; but wear a cap of a peculiar structure, which the laws of civility will not allow them to put off; it is different for the different nations of the year; that used in summer, is in form of a cone, ending at top in a point. It is made of a very beautiful kind of mat, much valued in that country, and lined with fatting; to this is added, at top, a large lock of red silk, which falls all round as low as the bottom; so that, in walking, the silk fluctuates regularly on all sides, makes a graceful appearance; sometimes, instead of silk, they use a kind of red hair, the lufro whereof no weather effects. In winter they wear a flat cap, bordered with marllet's, or box's skin; as to the relf, like those for the summer. Nothing can be neater than these caps; they are frequently fold for eight or ten crowns; but they are so short that the ears are exposed.

The cap or bonnet is a mark or ornament of certain characters: thus churchmen, and the members of universities, students in law, plying, and as well as graduates, wear "square caps." In most universities, doctors are distinguished by peculiar caps, given them in alluming the doctorate. Wickliffe calls the canons of his time *birettes*, from their caps. Paquier observes, that in his time, the caps worn by the churchmen, &c. were called "square caps," though, in effect, they were round yellow caps.

The cap is sometimes also used as a mark of infamy: in Italy the Jews are distinguished by a yellow cap; at Lucca by an orange one. In France, those who had been bankrupts were obliged ever after to wear a green cap, to prevent people from being imposed on in any future commerce. By several arrets in 1684, 1652, 1628, 1688, it was decreed, that if they were at any time found without their green cap, their protection should be null, and their creditors empowered to call them into prison: but the practice is not now continued.

Cap of maintenance, or cap of state, one of the regalia or ornaments of state belonging to the kings of England, before whom it was carried at the coronation and other great solemnities; and also of the mayors of several cities in England. It is of crimson velvet faced upermine, with two points turned to the back; and was formerly esteemed a badge and symbol of dignity, and suitable to a prince of the blood, being worn by king Edward III. and succeeding kings of England down to Edward VI.; but of late it hath been granted to private families. It is frequently to be met with above the helmet, instead of a wreath, under gentlemen's crests.

Cap of a gun, is a piece of lead which is put over the touch-hole of a gun, to keep the priming from being wafted or spilt.

Cap, in a ship, is a square piece of timber, put over the head, or upper end of a mast, having a round hole to receive the mast. By these caps, the top-masts, and top-gallant-masts, are, kept steady and firm in the trefiel-trees, where their foot stands; as those of the lower-masts do in their steps.

Or, a cap is a thick block of elm-timber, with two holes perpendicularly to its length and breadth, and parallel to its thicknefs, (the foremost hole being round, and the after one square), used to confine two masts together, when one is erected at the head of the other to lengthen it. The main and foremast caps of large ships are of elm, and made of two pieces coaked or doubled together in the middle; and others are of one solid piece. The main cap, in length, is to be four times the diameter of the top-mast, with the addition of three inches; the breadth is to be twice the diameter, with the addition of two inches; and the depth four-ninths of the breadth. The fore cap, in length, is to be four times the diameter of its top-mast, with the addition of two inches; the breadth twice the diameter, with the addition of one inch; and the depth four-ninths of the breadth. The length of the mizen cap is to be four times the diameter of its top-mast, with the addition of one inch; the breadth, twice the diameter; and the depth four-ninths of the breadth. The caps of yachts and similar vessels have a sheave-hole on each side for the jeers of the lower yards. If the cap is made of two pieces, the thicknefs of the coak is added to one piece. When the coak is adjusted, the two pieces are bolted through with fix bolts, one inch diameter, two at each end, and two in the middle, which are driven from each side alternately and clench on a ring. The holes are let off from the centre of the under-side of the cap at equal distances, and the distance between the holes is to be two-fifths of the diameter of the round hole, and half the tapering of the mast head in its length. The round holes of all caps are leathered and nailed on the upper and lower sides. In order to allow for the shrinking of the caps, the size of the tenon is taken 1½ inch above the flops, and that is let off on the under side of the cap; the caps are also to be raised above a level from the middle-line on the mast ¾ of an inch to a foot in length, in order to allow for their drooping. See MASS, and Plate of Ships.

Cap, is also a semicircular projection from the sides and round the end of a block, above the pin; through which two holes are bored, obliquely from the sides, meeting and forming an angle at the end; through these holes the flirt is passed, to prevent its being chafed. See BLOCK.

To Cap, is said of a ship in the trials of the running or setting of currents.

To Cap a rope, is to cover the end with tarred canvas, which is whipt with twine or spun yarn.

Cap, in Chemistry, signifies the piece which terminates the top of a melting furnace.

Cap, in Geography. See Button Island.

Cap, in Phytology, a name given to the hulk or green succulent coat which covers the upper part of a nut, and connects it with the parent tree. The cap consists of a pillaring and parenchyma derived from the bark, and ramifications from the ligneous body of the branch.

Cap of a mushroom, is the head or superior part expanded over the foot flake, somewhat in manner of a canopy, or umbrella.

Cap, or great Cap, in Surgery, a denomination of a kind of compendious bandage, serving for almost all occasions of the head, being in figure not unlike a helmet. Among chirurgical infirmities we meet with a silver cap, *pilatus argentius*, (though of late also made of wood, or even white wax), perforated at both ends, applied to the paps of nursing women, when ulcerated, for the more commodious giving of suck.

Cap, black, in Ornithology, the pewit, *Tringa parus*.

Cap, black, also the *moluccella atrae-pilla*.

Cap, Neptune's. See Neptune.
C A P

CAP, a pipit, in Fortification. See Bosny à precer.

CAP, merchant, in a trading ship, is the same officer who is called purser on board a man of war. The French call him writer (écritain). He is appointed by the merchant to whom the ship belongs, to take care that nothing be embez- zled or squandered away.

CAPACI, in Geography, a town of Naples, in the province of Casertana; four miles west of Villa. C. PACI, a town of Naples, in the province of Prin- cipato Citra, the seat of a bishop, suffragan of Salerno; five miles north of Agropoli.

CAPACITY, in General Science, an aptitude or disposition to retain or hold any thing.

CAPACITY, in Geometry, denotes the solid content of any body; and "measures of capacity" are our hollow measures for wine, beer, corn, falt, &c.

Capacity, in Law, signifies the ability possessed by an individual, or body politic, to give or take lands, or other things, or to sue actions. Our law allows the king two capacities, a natural and a political: in the first he may pur- chase land to him and his heirs; in the latter, to him and his successors. An alien born hath insufficient capacity to sue in any personal action, and is capable of personal estate; but he is not capable of lands of inheritance. See Alien.

Perfons attained of treason or felony, idiots, imbeciles, in- fants, &c. are not capable of making any deed of gift, grant, or conveyance, unless in some special cases. Co. Litt. 171. 172. See Infant, Idiot, &c. All persons are capable of committing crimes and suffering punishment, on behalf of whom the want or defect of will cannot be le- gally pleaded. There are three cafes in which the will does not join with the act, viz. where there is a defect of under- standing; where there are understanding and will sufficient, but not called forth and exerted by the party possessing them at the time of the action done, as in the case of all offences committed by chance or ignorance; and where the action is constrained by some outward force or violence. Before the cafes comprehended under these particulars, there is one more in which the law supposes an incapacity of doing wrong, from the excellence and perfection of the person: this is the cafe of the king, who, by virtue of his royal pre- rogative, is not under the coercive power of the law; which will not suppoze him capable of committing a folly, much less a crime. Black. Com. b. iv. c. 2.

Capacity, in the Modern Doctrine of Heat, signifies the proportional capability of a given quantity of any substance to absorb and retain caloric; or that disposition or property by which various bodies respectively require more or less of this fluid to superinduce any given temperature in a given mass. See Caloric and Temperature.

That this capacity varies in different bodies, and even in the same substance in different states, may be safely shewn. If the quantities of heat necessary to be added to or taken from bodies, in order to produce equal changes in their temperature, were in all cases proportional to their respective quantities of matter—as if, for example, it would require the same quantity of this fluid to heat a pound of water, a pound of oil, or a pound of mercury twenty degrees; this would, of course, indicate that their capacities were equal: but if, on the contrary, it should be found that the same quantity of caloric applied to these various substances should produce different changes in the temperature of equal quantities, or equal changes in the temperature of different quantities of each, it would follow that their capacities for the fluid must proportionally vary. Let us conceive that having three several pounds of water at the temperature of 110° of Fahrenheit’s thermometer in separate vessels, there be added to the first a quantity of water at 70°, to the second a quantity of water at 150°, and to the third a quantity of water at 90°; and that each of the mixtures be stirred together, and the addition continued, till they have all assumed throughout a common temperature of 70°. Now, as each of the pounds of water has, in this case, been deprived of an equal quantity of caloric, (viz. as much as was necessary to raise its temperature 40°, or from 70° to 110°,) the absolute capacities of the whole of the water, the oil, and the mercury, which have been added, must of course be equal, whatever be the quantity of each; of each of them having absorbed an equal quantity of heat. On comparing the quantities of these latter substances, how- ever, it will be found that we have employed in the experiment about 2 pounds of water at 50°, 4 pounds of oil, and near 60 pounds of mercury, each of which has been heated 20°; so that it requires as much caloric to heat one pound of water 20° as to produce the same effect on two of oil, or thirty of mercury; and their relative capacities are therefore inverely in this proportion.

Nor is it only among substances which essentally differ in their nature that this difference is found: the same body in different states of existence presents us with equal varieties in its capacity. A change in this respect is producible in three ways: by mechanical compression or dilatation, by chemical combination, or by the action of heat itself; of each of which we shall lay a few words.

With regard to the first, the general fact appears to be, that wherever a body is by any means condensed, its capacity becomes diminished; but that where it is dilated or en- larged in its bulk, it is proportionally increased. Thus, if a thermometer be filled up in a receiver, and a quantity of air condensed into it, the mercury will rise; a part of the caloric which is contained in the air being, as it were, squeezed out by its compreffion, and forced into the mercury in the bulk, whose temperature is consequently raised; if, however, on the contrary, the air be rared, the thermo- meter will indicate cold; the capacity of the air in the receiver being increased by its rarefaction, and a portion of the caloric in the continuous bodies consequently absoved, whereby their temperature is lowered and the bulk dimin- ished. It seems probable also that the heat produced by friction or percussion is, in like manner, to be referred to this kind of diminution in the capacity of the subject.

The second mode of changing the capacities of bodies is by their chemical combination; and it is perhaps true, that there is no combination unaccompanied by such a change. In some instances this takes place in a very remarkable degree, and it is from hence that we derive the effects of caloric and frigorilic mixtures. If, for example, a quantity of fulphuric acid, diluted with an equal measure of water, be poured on a quantity of crystals of Glauber’s salt recently powdered, the capacity of the compound is considerably greater than that of its component ingredients, it becomes therefore strongly absorbent of caloric, which it attracts from the bodies in its vicinity, and a quantity of water in a phial placed in the mixture will be soon frozen. The con- verte takes place in the combination of water and sulphuric acid. The capacity of the compound becomes diminished by the mutual attraction of the particles of its ingredients; a portion of the caloric which it contains is therefore ex- tracted, and heat is produced by its emulsion.

The third case of change of capacity, by the action of heat itself, is perhaps the most productive of more important effects in nature than either of the former two. The capacities of all bodies are increased in some proportion to the dilatation of their bulk, and the disaggregation of their constituent particles.
particles as well by the agency of caloric as by any other cause. Hence, when a solid is dissolved, or a liquid resolved into vapour, cold is produced by the augmentation of its capacity; and evapors, when steam is condensed, or congelation takes place, heat is developed by its diminution. Thus, if equal quantities of pounded ice and water, each at 32° of Fahrenheit, be exposed to heat in two similar vessels in a water-bath, the water will be heated to 15° before the ice is all dissolved, the water produced from which will of course still remain at 32°, so that the increase of capacity in the ice, during its solution, is sufficient to enable it to afford, without any elevation of its temperature, such maximum capacity as has raised the temperature of an equal quantity of water 146°; and the like quantity is also again emitted, on its becoming again condensed. If a quantity of water be exposed without agitation to a degree of cold equal to 4° or 5°, it will frequently acquire this temperature without freezing; but as soon as congelation begins, the thermometer will immediately rise to 32°, and the whole will remain at that temperature till all the water is converted into ice. From the quantity of heat which is absorbed by ice during its solution, and the relative capacities of ice and water, which he conjectured from his experiments to be 9 to 10, Dr. Crawford concludes that, as water on freezing appears to give out 146°, and this constitutes 1/20 of all that it contains, it is probable that the temperature of a body which was entirely divided of heat would be 146° below the freezing point, or 148° below the zero of Fahrenheit's thermometer.

This latter change of capacity appears manifestly to be absolutely essential to the well being of the universe, as affording a connate modification of the action of heat and cold, whose effects would otherwise be inordinate. If this did not take place, the whole of a mass of water which was exposed to a temperature above the boiling point would be instantly diffused in vapour with explosion. The fact, however, is, that the capacity of those portions of the liquid which are successively resolved into vapour becomes thereby sufficiently augmented to enable them to absorb the superabundant caloric, as fast as it is communicated; and it is for this reason that boiling water in an open vessel never reaches a higher temperature than 212°. The polar ices would all instantaneously diffuse, whenever the temperature of the circumambient air was above 32°. If it were not that each particle absorbs a quantity of caloric in its solution, and thereby generates a degree of cold which arrests and regulates the progress of the thaw; and the converse of this takes place in congelation, which is in its turn moderated by the heat developed in consequence of the diminution of capacity, which takes place in the water during its transition to a solid state.

CAPALITA, in Geography, a large town of North America, in the province of Guaxaca. The adjacent country abounds with sheep, cattle, and excellent fruit.

CAPAN, in Commerce, an East Indian coin worth 3d. in value.

CAPANABASTIA, in Geography, a town of North America, in the province of Chiapa in Mexico; 70 miles S. E. of Chiapa des Esparagones.

CARACOGO of Buffon, in Ornithology, the hawk-owl of English writers, Strix Hudsonia of Gmelin, and Strix ferrall Hudsonia of Buffon.

CARAISON, or CAPARISON, the covering or elasmonic laid upon a horse; especially aumper or horse of flate.

The word is Spanish, being an augmentative of capa, cape, head.

Anciently the cuparirona were a kind of iron armor, wherewith horses were covered in battle.

CAPASIS, in Geography, small islands near the east coast of Malacca, in the East Indies. N. lat. about 5°. E. long. 103° 30'.

CAPAPS, a kind of head-dress worn by the women of Canda. It is of a fleshed muffin, and is made so as to stand up very high, and extend a great way on the right side. Pococke's Egypt, vol. ii. part ii. p. 10.


CAPE ASTER. See Cineraria Anelloides.

CAPE JASMINE. See Gardenia Florida.

CAPE, in Geography, a head-land; or the extremity of a piece of land, or promontory, running out beyond the reef, into the sea.

CAPE ABACOU, lies near the west end of the south coast of the island of St. Domingo, N. lat. 18° 4'. W. long. 74°.—C. St. Agnes. See St. Agnes.

C. Aqua, a cape of Spain, on the coast of Murcia, in the Mediterranean. N. lat. 37° 32'. W. long. 3° 37'.—C. Audor, of Geer. See Aguer and Geer.

C. Agua, a double point of South America, on the coast of Perú. S. lat. 6° 38'. W. long. 80° 55'.—C. Aguilla. See Aguillar.

C. Alga, a cape of Spain, on the coast of Bifcay, in the Atlantic. N. lat. 45° 32'. W. long. 3° 18'.—C. Albate. See Albate.

C. Albani. See Albania.

C. Algier, a cape on the N. W. coast of the island of Majorca. N. lat. 39° 40'. E. long. 2° 38'.—C. Alice, a cape of Naples, on the E. coast of Calabria Citera, in the gulf of Taranto. N. lat. 39° 30'. E. long. 17° 20'.—C. Amanteo, a cape of St. E. coast of Corfica, and northern part of the entrance into the bay of Bonifacio. See Amone.

C. Ambra. See Ambra.

C. Ammou. See Amoushe.

C. Ancora, a cape on the W. coast of the island of Cabrera, on which are 39° 6'. W. long. 3° 8'.—C. Ancor, or Ancuca, the N. point of the island of Chiloe, in the S. Pacific Ocean. S. lat. 42° W. long. 80°.—C. Anduras. See Anduras.

C. Anduras, Andouil, Ann and Anna. See the Articles.

C. St. Anthony, a cape on the E. coast of Newfoundland. N. lat. 51° W. long. 3° 56'; also, the N. W. point of Staten land, in the straits of Cape Mars. S. lat. 54° 46'. W. long. 63° 45'.—C. Antio, Antongil, Antonio, Apollonio, and Arca. See the respective Articles.

C. Argens, a cape on the E. side of Newfoundland. N. lat. 52° W. long. 5° 15'.—C. Argentar. See Argentar. C. Argentenos, a cape on the southeast coast of Sardinia, 2 miles W. of Argentena. N. lat. 39° 28'. E. long. 8° 36'.—C. Armir, a cape of Naples, on the southern coast of Calabria Ultra. N. lat. 37° 52'. E. long. 16° 1'.—C. Abg une-mon-bas, a cape of Algiers, in the Mediterranean. N. lat. 37° 15'. E. long. 5° 10'.—C. Afirara, the N. W. point of Sardinia. N. lat. 40° 58'. E. long. 8° 13'.—C. Ava, St. Augylina, Baba, Biffa, and Bajador. See the several Articles.

C. Bainetta, a cape on the south west of the island of St. Domingo, near a village of the same name. N. lat. 18° 13'. W. long. 73° 51'.—C. Bajola. See Bajola.

C. Bayona, a cape on the E. coast of Africa. S. lat. 15° 15'. E. long. 39°.—C. Biaum, lies on the coast of Morocco, in the Mediterranean. N. lat. 35° 32'. W. long. 3° 46'.—C. Ballaghian, Ballard, Barba, Bardifan, Barfleur, Barnabaz, St. Barbolone, Baffa, Bussat, Boat's, and
and Beata. See the respective Articles.—C. Bocor, a cape on the coast of Egypt, in the Mediterranean; 4 leagues N. N. E. of Alexandria.—C. Buda, Bedford. See the Articles. C. Bega, a cape of Spain, on the coast of Catalonia, in the Mediterranean. N. lat. 41° 57'. E. long. 28° 19'.—C. Berberia, a cape on the W. coast of the island of Formenca, in the Mediterranean. N. lat. 38° 41'. E. long. 1° 35'.—C. de Berod, a cape on the N. coast of Egypt, in the Mediterranean. N. lat. 31° 29'. E. long. 31° 16'.—C. Bonaparte, a cape on the E. coast of Majorca, N. lat. 39° 35'. E. long. 4° 35'.—C. Bernard, a cape of Egypt on the N. coast, in the Mediterranean. N. lat. 31° 6'. E. long. 33° 43'.—C. Blancas, a cape of South America, on the coast of Terra Firma. N. lat. 10° 28'. W. long. 67° 16'. Also, a cape on the S. coast of the island of Sicily. N. lat. 37° 28'. E. long. 15° 11'.—C. Beja, a cape on the S. coast of the island of Corfu. N. lat. 37° 28'. E. long. 25° 4'.—C. Beja, a cape on the S. W. coast of the island of Cyprus. N. lat. 35° 12'. E. long. 32° 17'.—C. Beja, a cape of Spain, on the coast of Almeria. N. lat. 43° 26'. W. long. 6° 37'.—Also, a cape on the W. coast of the island of Iviaca. N. lat. 39° 2'. E. long. 1° 34'.—Also, a cape on the S. coast of the island of Majorca. N. lat. 39° 22'. E. long. 2° 59'. For other capes of this denomination, see BLANCO.—C. St. Blaise. See BLAISE.—C. St. Blaise, the outermost point of Mollaf bay, in the Cape of Good Hope. S. lat. 34° 10'. E. long. 22° 18'.—C. St. Breas, a cape of America, on the coast of the Ithmus of Darien. N. lat. 8° 36'. W. long. 75° 24'.—C. Blys, a cape on the E. coast of Labrador. N. lat. 53°. W. long. 55° 30'.—C. Bocce, a cape on the W. coast of the island of Sicily. N. lat. 37° 51'. E. long. 12° 43'.—C. Bogeqela, a cape on the south-coast of Africa. 150 miles S. W. of Cape Faralh. N. lat. 14° 15'. E. long. 48° 15'.—C. Boidar and Bon. See the Articles.—C. Banadria, a cape of Africa, on the coast of Barbary, in the Mediterranean. N. lat. 35° 20'. E. long. 23° 14'.—C. Bonaventura, Bonaventure, and Bonavista. See the Articles.—C. Broja, a cape of America, on the N. coast of the Ithmus of Darien. N. lat. 9° 22'. W. long. 8° 10'.—C. Break. See BREAK.—C. Bredanlia, a cape of Scotland, on the W. coast of the island of Rum. —C. Brum. See BREMA.—C. Breton. See BRANNON.—C. Brest. See BERTIN.—C. Brown. See BROWN.—C. Brux, on the coast of the northwestern coast of New Zealand. S. lat. 39° 17'. E. long. 174° 37'.—C. Bridal, Bredal, and Bredal. See the respective Articles.—C. Brede, a cape of Spain on the N. coast of Galicia. N. lat. 43° 41'. W. long. 7° 7'.—C. Bustado, the northern point of Zebu or Sibiu, one of the Philippine islands. N. lat. 11° 6'. E. long. 122° 31'.—C. Buzano, a cape of Naples near the southern extremity of Calabria Ultra, on the E. coast. N. lat. 37° 56'. E. long. 16° 29'.—C. Byle, a cape of Spain, on the coast of Almeria. N. lat. 43° 37'. W. long. 6° 14'.—C. Butifara, a cape on the S. W. of Minorca. N. lat. 39° 48'. E. long. 4° 28'.—C. Byron, the S. W. extremity of New Iceland, in the Pacific ocean. S. lat. 20° 30'. E. long. 149° 2'.—Also, a cape on the N. E. coast of New Guerniny. S. lat. 10° 40'. E. long. 16° 49'.—Also, a cape on the E. coast of New Holland. S. lat. 23° 37'. E. long. 153° 30'.—C. Cabren. See CABRIN.—C. Cacci, a cape on the W. coast of Sardinia, 13 miles W. of Algeri.—C. Caglia. See CAGLIA.—C. Cabôchê, a cape on the W. coast of Porto Rico. N. lat. 18° 28'. W. long. 31° 34'.—C. Calibro, a cape on the N. coast of the island of Java. S. lat. 6° 18'. E. long. 11° 45'.—C. Camboa, the southern extremity of the kingdom of Camoiba, on the eastern coast of the gulf of Siam. N. lat. 6° 10'. E. long. 182° 36'.—C. Camoiba, a cape of North America, on the coast of Honduras. N. lat. 15° 30'.
CAFE OF GOOD HOPE.

expired after this event, that Van Riebeck, surgeon of a
ship that put into the Cape for the usual purpose, made re-
presentations of the riches of the soil, the mildness of the
climate, the advantages it would give to the Dutch, as a
colony, over other nations, whose ships would all be enabled
to touch there, and, above all, the barrier it would afford
to their Indian dominions; which prevailed on the directors
of the Dutch East India Company to form a regular esta-
blishment at the Cape. Van Riebeck was appointed admiral
of four ships properly equipped for such an expedition,
and, on his arrival at the Cape, governor in chief, with full
power to establish a settlement. He no sooner proposed
than concluded a treaty; and the Dutch took immediate
possession of the Cape, which was surrendered to them
by the natives with great solemnity. Van Riebeck erected a
square fort, containing lodgings, warehouses, and an hos-
pital for the sick, and raised outworks and batteries to
secure their settlements from all attacks. The original inten-
tion of the Dutch seems to have been to limit their posses-
sions to the Cape peninsula, and the two bays that are divided by
the illims; considering it only, as it had hitherto been, a
place forrefreshing and refitting their ships. But the num-
ber of settlers that joined them from time to time, in con-
sequence of the placard which they published for their en-
couragement, made it necessary to cross the illims, and,
by presents and promises, to obtain from the natives the
cession of a tract of land, to which they gave the name of
"Hottentots' Holland." The natives had probably no
idea of resigning, for ever, to a foreign nation, the ground
that was necessary for feeding their own cattle; but con-
ceived it could only be intended for temporary use, and
that, in time, they would depart from the country, as other
Europeans had done for the last century and a half: but,
when they observed them building houses and fortifications,
fowling and planting the ground, and rearing their own
cattle, they began to be jealous of the encroachments of
their new neighbours, and commenced hostilities for the
purpose of expelling them. These hostilities terminated in
the further extension of the Dutch settlement, and in an in-
crease of troops and colonists from Europe. Still, however,
the Dutch East India Company endeavoured to limit the
Cape to the original design of a port for refitting their
ships. They threw every obstacle in the way of its becom-
ing a flourishing settlement; allowed no trade whatsoever
but that which passed through the hands of their own ser-
vants, and made it depend on the governor-general of
Batavia; concluding that the settlers would thus be made
equally submissive to their orders from Europe, and from the
fact of their wealth and influence in the East. A colony,
in such a state, with their declining commerce, entailed
upon them a burden and expense too heavy for them to
bear; and little doubt was entertained of their inclination to
part with it for a moderate sum of money, just before the
French revolution and its destructive consequences unsettled
the affairs of all Europe. Overtures to this effect were
intended to be made by England about the time when the
above unfortunate event took place. It became
wise and necessary, however, to recur to other means for
obtaining possession of this Dutch colony. Accordingly, an
expedition was sent out for this purpose; which was com-
misioned not to act in an hostile manner, but to hold the
Cape in defence and security for, and in the name of, the
prince of Orange, who, having departed from Holland,
unanswerable letters dated from London to this effect. Many
of the colonists had, in the mean while, imbibed French
principles, and became clamorous to declare themselves, by
force public act, a free and independent republic: they pre-
pared to plant the tree of liberty, and established a conven-
tion, whose first object was to make out proscribed lists of
those who were either in favour of death by the guillotine, or
to be banished out of the colony. The property marked
out to be the victims of an unruly rabble were fledged from
among the most worthy people in the settlement, and a great
portion of them were members of the government. The slaves,
whose numbers of grown men are about five to one of male
whites, had also their meetings to decide upon the fate of the
free and independentburghers, when the happy days of
their own emancipation should arrive.

In this state of things the British fleet appeared before the
bay; and it became necessary to commence hostilities. The
rocks of Muizenberg were soon cleared by a few shots from
a man of war, and the regular troops retreated to Wynberg,
a tongue of land projecting from the east side of the Table
mountain, and about eight miles from Cape-town. The
British troops, led on by general Sir James Craig, under the
orders of Sir Alured Clarke, marched to attack the enemy
on their elevated post, and aided by the sailors, soon obliged
them to retreat within their lines. A capitulation was pro-
posed and accepted, in September 1795; and the next day it
was concluded between the two parties. By the 6th article
of the treaty of peace at Amiens in March, 1802, it was stipu-
lated, that the port of the Cape of Good Hope should remain
to the Batavian republic, in full sovereignty, in the same man-
ner as it did previous to the war; but that the ships of every
kind belonging to the other contracting parties should be al-
lowed to enter the said port, and to purchase necessary pro-
visions, without paying any other impost than such as the Ba-
tavian republic demands the ships of its own nation to pay.

In order to form a just idea of the dimensions of the
Cape settlement, we may suppose a straight line to be
drawn from the southern point of the Cape peninsula,
which, however, is not the southermost point of Afri-
can, in the direction of east by north, and this line will inter-
sect the mouth of the Great Firth river (the Rio D'Infante of
the Portuguese), which is now considered as the eastern bound-
ary of the colony. The length of this line is about 580
miles. Again, if from the same point a straight line is
drawn in the direction of north, with a little inclination
westerly, it will fall in with the mouth of the river "Kouffle,"
the northern boundary of the colony, at the distance of about
315 miles. Moreover, if from the mouth of the Great Firth
river, a line drawn in the direction of north-north-west, be
continued to the distance of 225 miles, to a point behind
the Snowy mountains called "Plettenberg's land-mark," and
from thence be continued in a circular sweep inwards to the
mouth of the river "Kouffle" upwards of 500 miles; these
lines will circumferibe the tract of country which constitutes
the colony of the Cape of Good Hope. By reducing this
irregular figure to a parallelogram, it will be found to com-
prehend an area of at least 120,000 square miles; and as the
whole population of whites, blacks, and Hottentots, within
this area, amounts only to about 60,000 persons, every two
square miles may be said to have at least one human creature
allotted to it. But as this desert state of the colony is left
owing to the natural defects of the country, than to the re-
gulations under which it has been governed, the population,
complied with the extent of surface, ought not to be taken
as the test of the intrinsic value of the settlement; since the
population of any country, under a moderate climate, will,
in the natural course of things, always rise to a level with
the means of subsistence. If we estimate the soil of the Cape
by the abundance or scarcity, the luxuriance or poverty, of
the native plants, independently of the clime, it would be
pronounced one of the poorest in the known world; for seven
parts
parts in ten of the above-mentioned surface are, for a great part of the year, and some of them at all times, altogether delirious of verdure. The upper regions of all the chains of mountains are naked masses of sand-flour; the valleys beneath them are clothed with grasses, with thickets, and in some cafes with impenetrable forests. The inferior hills or knolls, whose surfaces are generally composed of loose fragments of sand-flour, as well as the wide sandy plains that connect them, are thinly strewn over with heaths and other flimsy plants, exhibiting to the eye a uniform and dreary appearance. In the lower parts of these plains, where the waters flow into, and filtering through the land, break out in springs upon the surface, vegetation is somewhat more luxuriant. In such situations the farm-houses are generally placed; and the patches of cultivated ground contiguous to them, like the "Oases," in the sandy defects, may be considered as so many verdant islets in the midst of a boundless waste. Of such plains and knolls is the belt of land composed, that lies between the first chain of mountains and the sea-coasts. Soils, in this tract of country, are generally either a stiff clay, impenetrable by the plough till they are soaked by much rain, or light and sandy, tinged with red and abounding with small round quartzite pebbles. A black vegetable mould seldom appears except in patches of garden-ground, vineyards, and orchards that surround the habitations, where, by long culture, manure, and the fertilizing influence of springs or rills of water, the soil is so far mellowed as to admit the spade at all seasons of the year. The extensive plains, known in the colony by the Hottentot name of "Karroo," which are interposed between the great chains of mountains, exhibit a more dismal appearance than the lower plains, which are chequered with patches of cultivated ground; and their hard surfaces of clay, glistering with small crystals of quartz, and condemned to perpetual drought and aridity, are ill adapted to vegetation. The hills that break these barren plains, are chiefly composed of fragments of blue slate, or masses of feldspar, and argillaceous limestone. However, in these Karroo plains, that are tinged with iron, and that are capable of being watered, the soil is extremely productive. In such situations, more especially in the vicinity of the cape, they have the beet grapes, and the beet fruit of every sort. The climate of the Cape is not unfriendly to vegetation; but it is so situated, within the influence of periodical winds, that the rains are very unequal, defending in torrents during the cold season, though hardly a flower fails to refresh the earth in the hot summer months, when the dry south-east winds prevail. These winds blast the foliage, blossom, and fruit of all those trees that are not well sheltered; nor is the human constitution secure against their injurious influence. They relax both the body and mind, and deplete their powers of energy and activity. As a protection from these winds, the colonists who inhabit the nearer side of the first chain of mountains, beyond which their effect does not very sensibly extend, divide that portion of their ground, which is appropriated to fruit groves, vineyards, and gardens, by oak fences; but they leave their corn lands altogether open. Indeed, a cape boor belows no more labour on his farm than is absolutely necessary; and as grain is mostly reaped before the south-east winds are set in, the enclosure of the arable land is omitted. The temperature of the climate at the Cape is remarkably affected by local circumstances. During the winter months, May, June, and July, the mean temperature, according to the statement of Kirwan (Ellis, &c. p. 102), seems to be from 45° to 55°; the heat scarcely exceeds 64°, and seldom falls so low as 34°; in summer the thermometer is generally between 70° and 80°, and sometimes between 80° and 90°; but scarcely ever exceeds 95°; the south-east wind, he adds, is the coldest. Mr. Barrow informs us (ibid infra), that there is a difference of at least from 6 to 10 degrees of Fahrenheit, in the summer months, between Cape Town and Wynberg, within a distance of only about 7 or 8 miles; which arises from the latter place being situated on the windward side of the Table mountain, and the former lying to leeward of it. The variation of climate, to which the Table valley is subject, led a British officer to observe, that those who inhabited it were either in an oven, or at the funnel of a pair of bellows, or under a water-spout. On the Cape side of the mountains the thermometer rarely descends below 40°; but on the elevated Karroo plains, within the mountains, it is generally, in the winter months, below the freezing point by night, and from 70° to 80° in the middle of the day. In order to account for the intense cold of the Karroo plains, Van Humboldt adds the chemical decomposition of the atmospheric air. As fat and clayey earths are strongly disposed to attract the oxygen from the atmosphere, by which the azotic gas is let loose: thin gas entering again in combination with fresh oxygen, of the superincumbent stratum, in an increased proportion, forms nitrice acid, from which salt petre is generated. The consequences of this formation which actually takes place in those plains, must necessarily be a great diminution of temperature.

We may now proceed to observe, that the great scarcity of water in summer is much more unfavourable to an extended cultivation than either the soil or the climate. The torrents of rain that descend for about four months in the year, deluging the whole country, disappear suddenly in the deep channels that intersect the country, and in consequence of their rushing with rapidity and violence into the sea, and leaving the deeply sunken beds of the rivers nearly dry, afford no sufficient supply of water to answer the purposes of irrigation. The periodical rivulets, and the streams that issue from the mountain springs, are either absorbed or evaporated before they arrive at any great distance from their sources; so that in this extensive colony one can scarcely say that there is a single navigable river. The two principal rivers, on the western coast, are the "Berg," or Mountain river, which rises in the mountains that enclose the vale of Drakenstien, and falls into St. Helena bay, and the "Oliphant," or Elephant's river, which, after collecting the streamlets of the first chain of mountains in its northerly course along their feet, empties itself into the Southern Atlantic in S. lat. 31° 30'. Although both these rivers have permanent streams of water, sufficiently deep to be navigable by small craft to the distance of about 20 miles up the country, yet the mouth of the former is choked up with a bed of sand; and across the latter is a reef of rocks. On the south coast of the colony the permanent rivers of any magnitude are the "Broad" river, which is discharged into St. Sebastian's bay; crofted near its mouth by a bar of sand, but navigable within this bar by small craft about 30 miles up the country, in which extent there are scarcely half a dozen farm-houses; and the "Gairnitz" river; the "Knysna," the "Keurboom," the "Camtoos," the "Zwartkops," the "Sunday" and the "Great Fifth" rivers; which see respectively. All these rivers are well stocked with perch, eel, and small turtle, and, to a certain distance from the sea-coast, they abound with almost every kind of sea-fish peculiar to this part of the world. Befide these rivers, the whole slip of land, stretching along the sea-coast, between the entrance of Falbe bay and the Great Fifth river, is inter-sected.
Cape of Good Hope.

fefted by严格的, whole waters are neither absorbed nor evaporated; but they generally run in such deep chasms, that they are of little use towards the promotion of agriculture by the aid of irrigation. In order to account for these deep chasms or cavities, and the general scarcity of springs, notwithstanding the quantity of rain, that falls at the Cape, Mr. Barrow suggests the following considerations. The continued chains of mountains in Southern Africa are composed of sandstone, reposing upon a base of granite. The granite base is sometimes elevated considerably above the general surface of the country, and sometimes its upper part is sunk as far beneath it. In situations where the former circumstance occurs, numerous springs are found, as in the Table mountain, where, on every side, copious streams of pure limpid water, filtered through the immense mass of superincumbent sandstone, glide over the impenetrable surface of granite, and furnish an ample supply to the whole town, the gardens, and the adjacent farms. But in those places where the sandstone continues to descend below the surface, and the upper part of the granite base is sunk beneath the general level of the country, the springs that make their appearance are few and scanty. From these facts it is inferred, that the effluvia or exuviae in the sandstone mountains, being corroded in the lapse of ages, to a greater depth than the openings or conduits, which might, perhaps, at one time have given their waters vent, the springs can no longer find their way upon the surface, but ooze imperceptibly between the granite and the sandstone, below the general level of the country, glide in subterraneous streams to the sea. It is a well known fact, that on almost every part of the isthmus that connects the mountainous peninsula of the Cape to the continent, fresh water may be procured at the depth of 10 or 12 feet below the sandy surface. Other facts of a similar nature serve to evince the erroneousness of the opinion, that has generally prevailed, that the several bays of the colony cannot, without great difficulty, if at all, be supplied with fresh water. This great depth of the commencement of the granite base below the surface may also better account for the most considerable rivers of Africa losing themselves in the sand, before they reach the sea, than by supposing the interior parts of this continent to be lower than the level of the ocean.

Another circumstance that has very much contributed to retard the cultivation of the territories adjoining to the Cape, is the extreme indolence of the colonists. In this fine climate they engage in little or no manual labour. The extent of the forests, beginning at Mossel bay, and running eastward parallel to the sea-coast, is at least 250 English miles, and the breadth from the base of the mountains to the sea is 10, 15, and in some places, 20 miles. Of this tract a great part is composed of large and beautiful plains, intersected by numerous rivers, and abounding in lakes full of excellent fish. The ground is well adapted either to pastoral or tillage, and capable of complete irrigation; but the farmers here, as well as in all other parts of the colony, are, in general, beyond description; the grounds held by each being sufficient for a great number of industrious families. It has been said, that the flip of land between the first chain of mountains and the sea-coast, and from Zavellendam to Algoa bay, if well stocked with inhabitants, so that each would be under a necessity of labouring for a subsistence, would not only be able to furnish a supply of grain for the whole colony, but afford also a surplus for exportation. But though this opinion may not be entirely just, yet Mr. Barrow is confident, that, with the addition of the tract of country between the north range of mountains and the sea-coast, and from St. Helena bay to the Cape, the whole masse of people within the present limits of the colony might be more comfortably subsisted than they now are, and have an abundance of corn, cattle, wine, and other necessaries, over and above, for a garrison of 3,000 men, and for a fleet containing an equal number. But in order to make the country produce this supply, it will be necessary to procure a new face of inhabitants, or to change the nature of the old one.

It is impossible, says this ingenious writer, to convey, by any description, an adequate idea of the condition of the peafantry of the Cape of Good Hope; as it is so inconceivably different from that of the same chiefs in Europe, or indeed in any other part of the world. In the miserable hovels of the Cape boors, fatted beef, or flesh of the larger kinds of game, will be found hanging in the chimney, and the whole, or greater part of a slaughtered sheep may be seen unpended from the roof. A Cape boor never works. His greatest and most pleasing exertion is the killing of game. But in this kind of exercise he manifest no energy or activity, and submits to no fatigue. A Dutch boor never traverses the breadth on foot, but generally fires from the saddle; and even availing the fatigue of carrying his mufket, he is followed by a Hottentot boy, trained to ride or run after him as his armou-r-bearer. It is a mistaken notion, that the peafantry of the Cape are a poor and diffused people, overwhelmed with debt, burdened with taxes, and oppressed by the government in a variety of ways. This will sufficiently appear in the sequel of this article. But they are better fed, more industrious, more ignorant, and more brutal than any set of men, bearing the reputation of being civilized, upon the face of the whole globe. Inflances frequently occur of their savage and inhuman treatment of the Hottentots, whom they retain in a state of connection and dependence, by violence and oppression on one side, and by want of energy and patient suffering on the other. This fanguinary character of many of the African colonists may, perhaps, be owing, in a certain degree, to the circumstance of their having been soldiers in German regiments serving abroad; where the least relaxation from a rigid system of discipline is followed up by the greatest severity of punishment. People of this description, having rifen into influence by the general prosperity that followed the conquest of the settlement, and indulging indolent habits and luxurious living, become no less a curse to their persons than vulgar in their manners. Whilst they pay little attention to domestic and social intercourse, and are in a very culpable degree regardless of character, they are extremely tenacious of their rank. There are, however, many persons in the colony to whom these observations are not applicable; men, whose talents and information, propriety of conduct, and strict integrity, would command respect in any part of the world; but their number is not very considerable. The Malay slaves, in the service of the Dutch, are unaccountably preferred to the Hottentots; though they are generally much inferior to the latter in talents, and much more capricious, cruel, and revengeful. The proportion of slaves to whites, of both sexes and all ages, in the Cape town, is not more than two to one; but that of slave men to white men is near five to one. The field slaves belonging to the farmers are not, however, nearly so well treated as those of the town; yet infinitely better than the Hottentots who are in their employ; the farmer, indeed, having a life-interest in the one, and only 25 years in the other, is a circumstance that may explain the difference of treatment. The one, also, is convertible property, which is not the case with respect to the other. The country slaves, notwithstanding, are ill fed, ill clothed, work
work extremely hard, and are frequently punished with great severity; sometimes with death, when rage overpowers the dictates of prudence and the feelings of compassion.

Mr. Barrow, in the 2d volume of his "Travels in Southern Africa," has lately published, and a very much in detail, the advantages which the Cape of Good Hope possesses, as a military station; as a port and naval station; and as a commercialemporium and territorial acquisition. By a military station Mr. Barrow means, not only a garrison for the defence of the settlement, but likewise a depot, or place suitable for collecting and forming, in as always to have in readiness, a body of troops, either belonging to his majesty's regular regiments, or to the armies of the East India company, fitted and prepared for foreign service, and stationed for the climate either of the East or West Indies. This ingenious writer is of opinion, that the Cape of Good Hope eminently points out such a station. Its geographical position on the globe is such as evidently to recommend it for this purpose. It is situated between the south of Brazil and the north of India, and a direct communication by sea between both is thus formed, which is of great advantage to commerce and the interests of the British empire, as an emporium of Eastern produce; as furnishing articles of export for consumption in Europe and the West Indies; as taking, in exchange, for colonial produce, articles of British growth and manufacture; and as a central depot for the southern whale-fishery. The chief articles of colonial growth and produce confirmed upon the spot, and exported to the East Indies, Europe, and America, may be comprised under the heads of grain and pulse, wine and brandy, wool, hides and skins, whale oil and bone, dried fruits, salt provisions, soap and candles, aloes, ivory, and tobacco. The wheat produced at the Cape is said to be as good and heavy as that of most other parts of the world. A load of this grain consists of ten "muids," or facks, equal to 31 Winchellers bushels; and a "muid," or 3½ Winchellers bushels, usually weighs 120 Dutch pounds, which is equal to 1/414 pounds English. The returns are from 10 to 70, according to the nature of the soil, and the supply of water. Barley, i.e. beer or big, is a productive grain at the Cape, and is only used for feeding horses. Rice is also a thriving grain, and is little used except for cattle in a green state, which is much preferred, and are fit only for horses as green fodder. Peas, beans, and kidney beans, Indian corn or maize, and various kinds of millet, may be supplied to any amount. However, the Cape, in its present state, is not capable of exporting any grain. Wine and brandy may be considered as the staple commodities of the Cape of Good Hope. Ten or twelve different kinds of wine are manufactured at the Cape, having a distinct flavour and quality according to the farms on which they are produced. The best boiled wine that is made at the Cape, is the Madeira, sent to Holland and the Dutch settlements in India, taken by the Americans in exchange for slaves, and purchased by English merchants. See constantia.

The country border falls on the merchants in the town, where it is adulterated in a variety of ways. The pipe is called a "legger," and contains 8 half annas or 90 gallons; each legger paying to government a duty, on entering the town, of 3 rix-dollars. The farmer generally receives from 20 to 30 rix-dollars per legger, which, after adulteration, is sold from 40 to 60, and frequently at the rate of 80 to 100 rix-dollars. Brandy might become a very important commodity as an article of export; but the cultivators of the vine have at present no proper distilling apparatus, nor sufficient knowledge properly to conduct that which they have. It is exported at 80 to 150 rix-dollars per legger, and subject to the same toll, on entering the town, as wines: and both wine and brandy are liable to a further duty of 5 rix-dollars per legger on exportation. The whole export value of wines, including the Conflantia, and the brandy, may amount, one year with another, to about 5,000 rix-dollars, or 10,000l. currency. Wool, which has till a late period been neglected, is likely to become a source of colonial revenue. It is said to have been sold, in its rough state, in the London market at 3s. to 3s. 6d. the pound. It admits of great improvement. The mutton of the Cape sheep is coarse and dull of flavour. Hides and skins, both dried and salted raw, are an increasing article of exportation. The quantity of ox-hides exported may amount to between 2000 and 3000 annually, subject to a duty of 3½d. a piece. Thefe taken off cattle, killed in the country, are used as harness for their waggons, and thongs to supply the place of cordage. The skins of sheep, killed in the country, are converted into facks, and employed as clothing for the slaves and Hottentots. Few are exported. The skins of the wild antelopes and leopard, though brought occasionally to the Cape market, hardly deserve mention as articles of export; for the cape is the name with regard to rich feathers; the annual amount of which is very trifling. The whole value of one year's exportation of this article does not exceed 1000 rix-dollars; of hides and skins of every description not more than 5000 or 6000 rix-dollars. All the whales which have been caught in the bays of the Cape are females of a small size, and yielding from 6 to 10 tons of oil each. The bone is small, and, on that account, of no great value. Under the head of dried fruits, the most important articles are almonds and raisins. The cultivation of vines admits of great improvement; better grapes are not produced in any part of the world than those at the Cape of Good Hope; but neither their wines nor raisins are properly managed. The almonds are, in general, very small, but of good quality; and as the trees thrive well in the dry and warm states, the quantity of these nuts might be produced to an indefinite amount. Before the capture almonds sold from 15. to 15. 6d. the thousand, and raisins from 2d. to 3d. a pound; but their price has since considerably advanced. Dried peaches, apricots, pears, and apples, are not only plentiful, but good of their kind. The whole value of dried fruits, exported in the year 1803, amounted only to 24,42 rix-dollars, subject to a duty on exportation at the rate of 2½ per cent. Salt provisions are susceptible of great improvement by curing them at Algoa bay, and bringing them down in small coasting vessels to the Cape. Salt is spontaneously produced within.
within a few miles of Cape-town, by the evaporation of water in the salt lakes that abound along the west coast of the colony. "Two kinds of fish, the "Hottentot" and the "Snook," are salted and dried in the sun in large quantities, for the use of the agricultural slaves, who eat them by way of the bountiful effects of bullocks' livers and other offal, that constitute a great part of their food. Salt-hutter is a very material article for the consumption of the town, the Garrison, and the navy, and also for exportation. That which comes from the Snowy mountains is accounted the best; but very little of it is good. Soap is manufactured by almost every farmer in the country, and furnishes in some parts the means of procuring cloaths and other necessaries at their annual visit to Cape-town. The unctuous part is chiefly derived from the fat of sheep's tails, and the potatoes or harissa is the fixivated aches procured from a species of fahilia called "Camara," that grows abundantly on those parts of the Karroo, or deserts, that are intersected by periods of dry streams of water. Candles are seldom brought out of the country; but a vegetable wax, collected from the berries of a shrubby plant, the "Myrica Cereifera," plentiful on the dry maryl grounds near the sea-shore, is sometimes sent up to the Cape in large glasses and bottles, and sold from 1s. 6d. to 2s. a pound. The whole quantity exported in the course of 4 years amounted only to 598 lbs., value 63.20 rix-dollars. The hippopotamus, or sea-cow, whose teeth furnished the belt ivory, is no longer within the limits of the colony. The colony is capable of producing great quantities of tobacco; however, very little is exported, though the Cape tobacco is said to be as good, when properly prepared, as that of Virginia. As all grey, old and young, smoke, in the Cape, and as American tobacco generally brings a high price, the consumption of that of native growth is considerable. The inferior sort is used by slaves and Hottentots. The total value of every kind of colonial produce, exported in 4 years, from 1799 to 1802, amounts to 350,925 rix-dollars, or 60,184l. currency. From the above detail it appears, that the Cape of Good Hope is, in its present condition, of very little importance to any nation; confidered with regard to its articles of exportation.

The goods imported from England into the Cape, in 4 years, from 1799 to 1802, consists of woollen cloths, Manchester goods, hooery, haberdashery, and millinery, boots, shoes, and hats, cutlery, iron tools, stationary, bar and hoop iron, smiths' tools, household furniture, paint and oils, earthen ware, naval fles, tongues, hams, cheese, and pickles; and from India and China were imported Bengal, Madras, and Surat piece-goods, tea, coffee, sugar, pepper, spices, and rice. The Americans brought thither lumber, cargoes of deal plank, flares, bark, salt-fish, pitch, turpentine, and the Dunes, Swedes, and Hamburg ship's goods, cargoes of iron, plank, French wines, beer, gin, Seltzer water, coffee, preserve, pickles, &c. in exchange for refreshments, to defray the charges of repairs and other necessaries, or for hard money to carry to India or China. The whole importation into the Cape by British or foreign bottoms, from Europe, Asia, and America, in 4 years, including the value of the prize goods brought in, and of the cates imported in the same period, amounted to 597,745 rix-dollars; or 114,579l. currency.

When the Dutch East India company perceived their settlement extending far beyond the bounds which they had originally preferred, they found it expedient to divide the country into districts, and to place over each a civil magistrate with the title of "Landdrost," who, with his council called "Hemraad," was authorized to settle petty disputes among the farmers, or between them and the native Hottentots, levy fines within a certain sum, collect and apply the parochial assessments, and enforce the orders and regulations of government. The district was divided into a number of subdivisions, over each of which was appointed a "Feldwachtmeester" or country overseer, whose duty was to take cognizance of any abuses committed within his division, and report the same to the landdrost, to adjudge disputes about springs, or water-courses, and to forward the orders of government. The landdrost, however, had only the shadow of authority. The council and the country overseers were the original farmers, and were always more ready to frown and protect their brother homesteads, accused of crimes, than to avail in bringing them to justice. The poor Hottentot had, therefore, little chance of obtaining redress for the wrongs he suffered from the boors. If he espoused their cause, he became unpopular; and the distaste from the capital was a sufficient obstacle to the preferring of complaints before the court of justice at the Cape, which itself had little influence in enforcing its orders in a part of the country distant 5 or 600 miles. Hence it happened that murders and the most atrocious crimes were committed with impunity; and the only punishment was a sentence of outlawry for contempt of court, when the criminal did not appear to the famous, which sentence was little regarded. This extensive settlement is divided into 4 districts; those of the Cape, of Stellenbosch and Drakenstein, of Zweliland, and of Graaf Reynet, which fec respectively.

When the Dutch government obtained, partly by purchase and partly by force, a tract of country from the Hottentots, it made grants of land to the settlers on four different tenures. The most ancient of these is that of "loan" lands, which were granted to the original settlers of certain portions of land to be held on yearly leases, on condition of paying to government an annual rent of 24 rix-dollars. Every farm was to consist of the same quantity, and to be subject to the same rent, without any regard to the quality of the land. This tenure amounted by renewals of the lease, at first made only for one year, to a leasehold in perpetuity. The number of these loan-farms in the four districts amounted in 1798 to 1812, and supposing each farm to consist only of the usual allowance, or a square of 3 miles the side, the quantity of land in all these farms would amount to 10,552,320 acres, and the annual rent they produce is about 44,600 rix-dollars, or about 3 of a farthing per acre. The second tenure was that of "gratuity" lands, which were originally granted in loan; but, on petition of the holders, in consequence of some unfavourable services done to government, they have been converted into a form of annual hold liable to a certain rent, which, like the loan lands, is continued at 24 rix-dollars a year; the number of these estates is 107, which charge rent only at a certain rent, arising from pieces of waste-ground, which, being contiguous or convenient to an estate, have been allowed by government to be occupied by the owners of such estates upon a lease of 15 years, on condition of their paying an annual rent of one shilling per acre. The renewal on this payment is a matter of course. Of
Of such grants there are 35. The fourth tenure is that of "real estates" held in fee simple, and subject to no rent; and they are chiefly situated in the Cape district or its vicinity. There are the choicest patches of land, and have been originally sold or granted to the early settlers in parcels of about 60 morgen, or 120 English acres.

The 2,000 European inhabitants who compose the population of this colony may be divided into four classes; viz. the people of the town, wine-growers, graziers, and farmers, and graziers. The wine-growers, or wine-houses, occupy the hill-houses and the most valuable estates, and are the dependants of the French families who first introduced the vine. These estates are mostly freehold, in extent about 120 English acres, and mostly employed in vineyards and gardens.

They bring their wine to market from September to the new vintage in March; and the deep family roads over the CapePlains require 14 or 16 oxen to draw a log-gan or wine, whose weight is not 2½ tons. The wine brought to market is subject to a tax of 3 rix-dollars for every horse, and the brandy, palling the barrier, pays the same tax. The wine or brandy, confined at home, or held in the country, is free of duty; nor are they subject to any parochial taxes or assessments, a small capitation tax excepted.

The wine-farmers make their excursions in their tent-waggon drawn by six or eight horses. The corn-boors live chiefly in the Cape district, and those parts of Stellenbosch and Drakenstein, that are not more than two or three days' journey from the Cape, and are next in rank to the wine-boors. The grain, which they fell in the country, is subject to no tax or tithe; but a duty, about one tenth of the value, is paid at the barrier for all grain passing towards Cape-Town. Their parochial assessments are the same as those of the wine-boor. The colonists of the Cape are very bad agriculturists, and over their crops more to the goodmen of the soil and favourable climate than to their own skill or industry. Their plough is an unworkable machine drawn by 14 or 16 oxen, which jolt ploughs the surface and does not penetrate the plough soil. Such grounds, when ploughed, are endless more rough than the roughest len-ploughing in England. They rarely give themselves the trouble of manuring, except for barley. For returns of corn they generally reckon upon fifteen-fold, in choice places from 20 to 30, and more where they have the command of water. The grain is not threshed, but trodden out in circular floors by cattle. The annual balance in favour of the farmer is about 141. 13s. 6d. The graziers are those of Graaf Reinet, and other distant parts of the colony. They are the lead advanced in civilization. The hovels in which they reside have seldom more than two apartments, and frequently only one, in which the parents with fix or eight children and the house Hottentots all sleep. Their bedding consists of skins. The walls of their hovels are formed of mud or clay baked in the sun; they are sometimes constructed with fods and poles; and frequently a fort of wattling plastered over with a mixture of earth and cow dung, both within and without; and they are rudely covered with a thatch of reeds, seldom water-proof. As to their clothing, the men generally wear a broad-brimmed hat, a blue shirt, and leather pantaloons, no stockings, but a pair of dried skin shoes. The women have a thick quilted cap that ties with two broad flaps under the chin, and falls behind across the shoulders. They have a short jacket and a petticoat, no stockings, and frequently they use no shoes. The bed for the mother and midwife of the family is an oblong frame of wood, supported on four feet, and reticulated with thongs of buffalo's hide, so as to support a kind of mattress made of skins sewed together, and sometimes stuffed with wool. In winter they use woollen blankets. The bottoms of their cloaks or dresses are set with rows of leather thongs. A large iron pot faces both to boil and broil their meat. They have either been for the table, or knives, forks, or spoons. The house-cow with a large hoop, which he carries in his pocket, for the milk of the family. Their huts and their persons are equally dirty, and their whole appearance betrays an insularity of 1/2, and a low groaning mind. The women are greater drudges than the men, and yet they are not very industrious. Though cut from flax, serge, or all occasions, in lieu of rope, and fines cut from the tendons of wild animals are a substitute for thread. The folds of a "kraal," in which they house their cattle at nights immediately from the doors of their huts; and as they are never cleaned out, they increase the inhabinits of their dwellings. Few of the distant hovels have more than one floor, and many of them none; but the number of Hottentots, in an average, in Graaf Reinet, amounts to 15 to each family; and they are used with the most inexorable indumancy. The produce of the graziers is subject to no kind of colonial tax. They pay only a small parochial assessment proportioned to their flock; for every 100 sheep a florin, or 16d., and for every ox or cow 1d. The condition of the farmers is fuch, that each of them, upon a balance of his income and outgoings, lives annually 931. 16s.

The revenues of the colony are derived from the following sources; viz. land revenue arising from rents (already explained); places for grazing cattle taken by the month, and salt-pana duties on grain, wine, and spirits, levied at the barrier; transfer duty on sale of immovable estates; duty arising from the sale of buildings on loan farms; public vendue duty; fees received in the secretary's office on registering the transfer of property; customs; port fees; postage of letters; seizes, fines, and penalties; licences to retail wine, beer, and spirituous liquors; interest of the capital lent out through the loan-bank; and duty arising from stamped paper. The whole amount of this revenue in 1801 was 92,141. 13s. 4d. This revenue is applied to the payment of salaries on the civil establishment, the expenses of the several departmants, the repairs of government buildings, and the contingencies, and the ordinary expenses of the colony; and during the government of lord Macartney, when the Cape was in the possession of this country, the revenue was more than adequate to the expenditure.

The members of the court of justice at the Cape are chosen out of the burghers of the town. The fiscal, who is the public accuser in criminal matters, and the secretary of the court, are the only persons possessed of legal knowledge. The litigious spirit of the people, encouraged by the attorneys who enter into the profession without any knowledge of the law, multiplies causes; and the expenses of a single suit will sometimes amount to 400 or 500l. Which, though the object of litigation was not worth 100l. The office of fiscal, one of the most important in the colony, consists of the principal and a deputy, a clerk, two bailiffs, two jurors, eight constables, and 19 blacks and Malays, usually called "kaifers." The whole expense to government was under 10,000 rix-dollars; the court of justice and secretary's office amounted to about the same sum; so that the administration of justice cost the government very little. The names of commissions for trying petty suits (not exceeding 45l.) and for matrimonial affairs (or granting licences) consists of a president, vice-president, and four members, whose situations are honorary and biennial. The "weekkammer," or chamber for managing the effects of minors and orphans is one of the original institutions of the colony, and it is managed by a prelent
dent and four members, a secretary and several clerks. For the support of this institution all orphan property, passing through the chamber, suffers a deduction of 7% per cent. upon the capital.

The established religion of the colony is Calvinism, or the reformed church. Other sects are tolerated; the Lutherans have a church; a methodist chapel has been lately built; the Moravians have a church; but the Malay Mislimetans, being refused a church, perform their public service in the home-quarters at the head of the Cape town. The clergy are suitably provided for and generally respected in this country; and they rank next to the president of the court of justice in town, and the landdroths of the country. Besides their clerical duties, they have also the direction of the funds for the relief of the poor, which are raised by weekly donations at church, by legacies, and by the funds which the church demands on the annunciation of false. The amount of the funds belonging to the reformed church in Cape town, in 1798, was 22,168 l. 8s. 6d., and the subsistence granted to the poor was 1112 l. 17s. The funds of the Lutheran church were 14,892 l. 13s. 2d.; and the relief granted to the poor 194 l. 9s. 2d.

Cape ditriv, is the smallest, but the most populous, of the four districts into which the settlement of the Cape of Good Hope is divided. It consists of two parts; one, the peninsula on which the Cape Town is situated; the other, the strip of land extending from the shore of Table Bay to the mouth of the Berg river in St. Helena bay, and separated from Stellenboch and Drakenstein, by the salti lake, Deep river, and Moffel bank river; being about 80 miles from north to south, and 25 from east to west, and containing about 2000 square miles. The Cape peninsula is about 30 miles in length, and 6 in breadth, or 240 square miles. Of the Cape district there is one-fifteenth part of the surface under any kind of tillage. The produce of the Cape peninsula is grapes, with all the European and many of the tropical fruits, vegetables of every description, barley for the use of horses, and a small quantity of choice wine. The other parts of the Cape district furnish wheat, barley, pulse, and wine. The population of this district in 1797 amounted to 18,152 persons, of whom 6261 were Christians, and 11,891 slaves; of the Christians or free people, 718 are of colour, and 1000, nearly, are Europeans. By comparing the average number of deaths with the population, it appears that the mortality in the Cape district is about 2,245 in the hundred. That of the slaves is rather greater, but less, perhaps, than in any other country, where slavery is tolerated. The number of deaths on the average of 8 years, was 250, which is after the rate of 3 in 100. The quantity of land occupied amounted in consequence of a measure taken not very correct to 8018 morgen, or 16,263 acres; of which 500 morgen were employed in vineyards and gardens, and 3589 in grain. Capital crimes in this district are not numerous as might be fancied among such a mixed multitude, the great majority of which have no interest in the public prosperity or tranquility. As to the natural produce of this district, it is of little or no importance, if we except the fisheries. The collecting of shells for lime, and of heaths and other shrubury plants for fuel, furnish constant employment for about 1000 slaves.

It has been generally asserted, that the Cape peninsula was originally separated from the continent of Africa; and this opinion has been founded on a supposed retreat of the sea. Mr. Barrow, on the contrary, apprehends that the sea is gaining upon the land in Southern Africa; and adduces several facts in support of this hypothesis. From all the observations which he had an opportunity of making on the southern coast of Africa he concludes, that the whole of L'Aguilas bank, stretching from Cape Point across the entrance of False Bay to the mouth of Rio Infante or the great Firth river, and to the 37th parallel of southern latitude, has at one time formed a part of the continent. It has been alleged, indeed, in favour of the Cape town, having, at no long interval of time, been covered with the sea, that sea-shells have been found on the land that is accumulated on its surface. In reply to this argument, Mr. Barrow observes, that whole strata of these may be found in the sides of the Lion's Hill, many hundred feet above the level of the sea; and these shells, he adds, have been conveyed to this situation, not by the waves of the ocean, but by birds: and they are frequently found even on the very summit of the Table mountain.

Cape Town, the capital of the colony, is situated on the south-east angle of Table bay. The settlers seem to have chosen this spot for the site of the town for the convenience of water, which rushes in a plentiful stream out of the Table mountain. Saldaunabay would, in other respects, have been more suitable; as Table bay is faulty in every point that constitutes a proper place for the mart of shipping; and is boisterous for four months in the year, as totally to prevent all ships from entering into it. The town is built with great regularity; the streets being all laid out with a line. The houses are generally white-washed, and the doors and windows painted green; they are mostly two stories in height, flat-roofed, with an ornament in the centre of the front, or a kind of pediment; with a raised platform before the door having a hut at each end. It consists of 1145 dwelling-houses, inhabited by about 5500 whites and people of colour, and 9000 blacks. The minute plan of the town also contains all the several departments of government, the clergy, the members of the court of justice, and of the police. The next are a fort of gentry who, having estates in the country, retain the produce of them by means of their slaves: subordinate to these is a number of petty dealers, who call themselves merchants; and lastly, the tradesmen who carry on their several professions by their blacks. Many of the people of colour are fishermen. The salaried of those who are employed in the different departments of government, are so small that most of them are petty merchants. The country boors employ a fort of agents, who keep houfes to lodge their agents when they make their annual visit to the town. These are a kind of Jewish brokers, who subsist by defrauding the simple boors in the disposal of their property, and in the purchase of necessaries for them on their return. The emancipated slaves and people of colour are generally artisans; and many of them support their families by taking fish, of which there are great plenty and variety in Table bay. Upon the whole, the people of the town are an idle diffusate race of men, subsisting chiefly on the labour of their slaves, who are required to bring them certain fum at the end of every week, and what they earn above this sum belongs to themselves, by means of which some of those who are the most industrious have been enabled to purchase their own freedom, and sometimes that of their children. The price of provisions and that of labour bear no proportion. Butchers' meat is about 2d. a pound, and good brown bread, such as the slaves eat, 1d. a pound. A common labouring slave gets from 2s. to 2s. 6d. a day, and a mechanic or artificer 5 and 6 shillings a day. The people of Cape Town are almost all of them petty dealers, and they have a remarkable propensity for public vendues. These vendues are a kind of lottery; in which a man buys in the morning a lot of goods, which he again exposes for sale in the evening, sometimes gaining, and sometimes losing by his bargains.
CAPE OF GOOD HOPE.

Such is the rage for these venuses, that in four incessive months of the year 1831, the amount of property sold by public auction was 1,563,000 rix-dollars, a fund equal to the whole quantity of paper money in circulation, which may be considered as the only money which has of late been circulated in the country. House rent, fuel, and clothing are dear in the Cape-town, and yet there is no city or town in Europe, where the wants of the people are better lodged or better clothed. Fire is less necessary here than in most parts of Europe. During the continuance of the south-east winds, resembling in their effect the south-east Sirocco of Naples, the Cape-town appears to be defetected. Every door and window are closed to keep out the dust and the heat, both of which decrease with the continuance of the gale; the air gradually cools, and every small pebble and particle of dust in the course of 24 hours are carried into the sea. The north-west winds of winter produce a moist and cold feeling, even in Cape-town, where, though the thermometer seldom descends below 46°, and then only about an hour before sun-rise, all the English inhabitants are glad to keep constant fires during the months of July, August, and September. Even in October it is not unusual to observe the fumes of the mountain to the caffward of the Cape illusius buried in flour. The number of marriages in Cape-town considerably surpasses that of the whole colony, for eight years, from 1790 to 1797, inclusively, amounted to 1449; that of christenings to 2139; and that of burials to 1173; so that 1416 was the excess of christenings above burials in that period. The inhabitants of Cape-town are burthened neither with taxes nor affimations. At the first establishment of the colony a kind of capitation tax was levied under the name of "Lion and Tiger money," the produce of which was applied towards destroying beasts of prey; but since these animals have become scarce in the vicinity of the Cape, the name of the affimation is changed, but the fund supplied by it has been appropriated to the repairs of the roads, streets, water-courses, and other public works. Its ordinary amount is about 5000 rix-dollars a year. Another affimation, chargeable on heads of families at the rate of 12.6d. a month, for every house or fire-place, is called "Chimney and hearth money," and amounts to about 5000 rix-dollars yearly. The inhabitants of Cape-town are subject to no taxes nor church-rates; but as the church provides for the poor, every person manumitting a slave pays to it 10l. giving security that such slave shall not become burdenome for a certain number of years. The police of the town is committed to the management of a board, consisting of six bachelors, called the "Burgher Senate." The pleasures of the inhabitants are chiefly of the groffer kind, being those of eating, drinking, and smoking: they have no taste for public amusements, and no exercize but that of dancing. In the whole town there is neither a bookeller's shop, nor a book society. Under the direction of the church is a library, left by an individual, and consisting of many excellent books; but very little used. Books are rarely found in Cape-town to constitute any part of the furniture of a house. Education is so little regarded, that neither government nor the church has been able to raise a sufficient sum for establishing a proper public school in the colony; and few of the natives are in circumstances that allow of their sending their children for education to Europe.

One of the greatest misfortunes in Cape-town is the number of dogs that prowl about the streets, particularly by night, when they quit their dens and lurking places in quict of the offals of butchers' shops. Sometimes the wolves and hyenas defend from their dens in the Table mountain, and dispute the spoil with the dogs; at such times the town re-

CAFE VERD AND ISLANDS. See VERD.
C A P

Cape, in Law, a writ judicial, touching plea of lands and tenements; so termed, from the word which carries the chief intention or end of it.

Cape is of two kinds, the magnum and parvum; in which their effect are alike, as to the taking hold of things immovable; though in certain circumstances they differ: 1. In that the capa magnum, or grand cape, is before; and the capa parvum, or petty cape, after appearance. 2. Cape magnum summons the defendant to answer the default; and also over to the demandant: capa parvum only to the default. It is called petty cape, not because of its small force; but because contained in few words.

Cape magnum is thus defined in the old Nat. Brev. 161: "Where a man hath brought a procesc qual relict of a thing that touches plea of land, and the tenant makes default of the day to him given in the original writ; then this writ shall be for the king to take the land into his hands; and if the tenant come not at the day given him by the writ, he loses his land."

Cape parvum, or petty cape, is thus defined, ibid. "Where the tenant is summoned in plea of land, and comes at the summons, and his appearance is recorded; and at the day given him, prays the view; and having it granted, makes default; then shall this writ suffice for the king, &c."

Reg. Jud. fol. 1. 2. Br. ofl. 3. tra. 3. c. i. Hesta. 1. 2. c. 44.

Cape de tumultum, a species of capa magnum, so called from the end to which it tends: it is thus described, "Where I am impleaded of lands, and I vouch to warrant another, against whom the summons ad warrantandum hath been awarded, and he comes not at the day given; then, if the demandant recover against me, I shall have a writ against the voucher; and shall recover so much in value of the lands of the voucher, if he has so much; otherwise, I shall have execution of such lands and tenements as depend to him in fee; or, if he purchase afterwards, I shall have a re-fummons against him; and if he can say nothing, I shall recover the value." Old. Nat. Brev. 161.

Cape du Batardreau, in Fortification, the cap, upper part, or roof of the batardeau constructed on the ditch of a work at the fallant angle of the bailey. There is commonly raised or erected on the middle of it a small tower or turret, six or seven feet, to prevent defilements.

CAPECE, Sebastiano, in Biography, an eminent Latin poet of Italy, who was born of a noble family at Naples towards the beginning of the 16th century, and began his career as professor of jurisprudence in the university of his native city, but afterwards directed his attention to polite literature. His house was the resort of learned men, who produced in 1535 "Commentaries on Virgil," attributed to Donatus. He first attracted notice as a poet by three books in praise of St. John the Baptist, entitled "De Vate maximo." But his fame was chiefly owing to his poem in two books, "De Principiis Rerum," first printed in 1543, and dedicated to pope Paul III.; in consequence of which, Benno and Maunzio did not scruple to compare him, though without sufficient reason, with Lucrètius. This poem, with a translation and learned notes of the abbé Ricas, was reprinted, together with the other poems of Capece, who appears to have been living in 1591, at Venice, in 1734. Gen. Dict. Triebach.

CAPEDUNCULA, in Roman Antiquities, the veilings wherein the sacred fire of Vesta was preferred. See Vestals.

CAPEL, in Geography, a town of Germany in the duchy of Carinthia, on the Fella; 10 miles S. of Volkmarsen.

CAPELAN, in Ichthyology, a name given by writers to a kind of whiting called by the Venetians matlo, and by obsolete authors, stellus or Sinus minimus, and melangus. This is most probably gaudis minutus of the moderns, which Belon calls melangus, and is the smallest of its tribe. The melangus of Geber is certainly too large for the capelan, and appears to be the same with our common whiting, Gobius melanogaster.

CAPELINE, in Military Language, a sort of iron head-piece, or helmet, which the cavalry under John, duke of Burgundy, used to wear.

CAPELINE, in Surgery, a kind of bandage used by the French surgeons in cases of amputations, consisting of a roller with two equal heads.

CAPELL, Edward, in Biography, one of the numerous editors and commentators of Shakespeare, was born in the county of Suffolk, and died in 1781. His edition of Shakespeare, in 1768, was compiled in 20 volumes, small 8vo. with an "Introduction" of singular composition, announcing another work, which was published in 1769, under the title of "Notes and various readings of Shakespeare; together with the Chorals of Shakespeare, or Extracts from divers English books, that were in print in the author's time, evidently flowing from whence his several fables were taken, &c. &c." Mr. Capell was the editor of a volume of ancient poems, called "Prolusions;" and the alteration of "Antony and Cleopatra," as acted at Drury-lane in 1758. See Shakespeare.

CAPELL, in Geography, a town of Germany, in the duchy of Stria; 3 miles N. of Muertzhoflag.

CAPELLA, Matianus, in Biography, an African Latin writer, who flourished about the year 470, and is supposed to have resided at Rome. He is author of a work in nine books, which confines of prose and verse intermixed, upon the seven liberal arts. The title of his work is "De Nuptiis Philologae et Mercanti."

Of all his nine books, no one has been much noticed by the moderns, except the ninth, which treats of music. The few Romans who have read him upon this subject, and the eager desire of classical readers to obtain some knowledge of the means by which the ancients produced, by the power of modulated sounds, those miraculous effects which are recorded, not only by poets, but historians and philosophers, drew particular attention on this part of the work.

The author's plan is the following.

Perfunctory Philosophy and Harmony, or Poetry and Music, under the character of Mercury and Harmonia, he describes their union as a nuptial feast, at which Jupiter and all the heavenly host of Paganism attend; celestials as tertial cultivators of music, Orpheus, Amphion, and Arion, who are admitted among the celestials to partake of the entertainment. And after going over the old ground in relating the wonders which music has performed, in healing diseases, quelling seditions, tempering and bringing to reason the irreligious affections of unruly youth, Harmonia is defined by Apollo and Minerva to unfold the mystery of her art.

We shall not enter on a disquisition concerning the Latinity of this work, which by many critics has been termed barbarous, but confine our reflections to the information which inquirers into the arcana of ancient music are likely to derive from its perusal.

The author explains, by the mouth of Harmonia herself, the Greek scale of tones and femitones, giving Latin translations of the Greek musical terms, proceeding from Prophembanomena, the lowest found in the general system, and mount-
ing up to Hyperborea, ultima excolititation. The next period
of treatment of anomalous: that of modes; of single sounds;
harmonic parts of the syllable; of intervals; genera, keys, tetrachords; of the diapente and diatessaron, or 5th and 4th; of transitions; of melopoeia, rhythm, three kinds—the dae-
tylic, iambic, and sponian; and of six kinds of compound
rhythm.

This ninth book, according to Meibomius, may be re-
garded as divided into two parts: the first containing the
history of music, and its cologium, the second the theory
and precepts of the art itself; and this last is what we shall
chiefly consider, as to its utility. And in mercy to inquirers
after Greek music, or the music of the ancients in general,
we can assure them, that what has been so far sought in
vain among the seven Greek theorists published by Melbo-
mius, in Polyphony, Phutarch, and Boethius, will not be found
in Martius Capella. His definitions are awkward Latin
translations of what may be found not only in Arnulphus
Quintilianus, but in every Greek writer on music. He has
not given us one of the characters of either Greek or Roman
notation; nor is there, either in his encomium or definitions, a
word that encourages a belief that the ancients knew any
thing of simultaneous harmony, or music in parts; or even a
trait of the arrangement of single notes, to enable us to form
any judgment of their melody. The rhythms, of which so
many are mentioned, are thole of verse, which probably were
likewise thole of music.

He was the first from whom we received equivalents in
Latin for the Greek musical technics, and we find in his
poetry many new metres, which we do not recollect to have
seen in any other Roman poet. The learned work of Ca-
pella was first published by Vitalis, in folio, at Venice, in
1490, in a very incorrect state. The corrections of Hugo
Griuus at the age of 14 are among the wonders of literary
history. They were published at Leyden in 1599.

Another Capella, who was a writer of elegy, is com-
memorated by Ovid, "De Ponto."

CAPELLE, in Geography, a town of France, in the
department of the Straits of Calais, and district of Montreuil;
1 league S. of Hesdin.

CAPELLE, la, a town of France, in the department of
Alfue, and chief place of a canton in the district of Vervins;
4 leagues N.E. of Gue. The town contains 1,077, and the
canton 14,697 inhabitants; the territory includes 1873
kilometres and 18 communes.

CAPELLE-MARIN, la, a town of France, in the de-
partment of the Lot, and chief place of a canton in the
district of Figeac; 8 miles N.N.W. of Figeac. The place
contains 1,013, and the canton 12,132 inhabitants; the
territory comprises 215 kilometres and 20 communes.

CAPELEN, a town of Germany, in the duchy of
Sitra; 8 miles W. of Luttchenburg.

CAPELLETTI, a Venetian militia, composed of soldier
that partly were slaves, Dalmatians, Albanians, and Morla-
chians, and were regarded as the choicest and best troops of
the state of Venice. They were much confided in by the
Venetians, and were employed to guard their places of the
greatest importance, and amongst others the palace and place
of St. Mark at Venice.

CAPELLUTIUS, RELAND, in Biography, a distin-
guished physician and philosopher, who flourished in the
latter part of the 15th century, under the pontificate of
Paul II. published in 1490, "Chirurgia," printed at Venice
in folio, and reprinted with additions in 1519 and 1546. It
contains the whole body of surgery, collected principally
from Albuscat, and other Arabian writers. A polished
work of this writer was published at Franckfort in 1642, svo.

reprinted in 1649, 4to, and again in 1682, 8vo; "De Cur-
ratione Peliferorum Apollinarum," a practical work, much

CAPENA, or CAPENCA, Steph. Bye, in Ancient Geography,
a town of Italy in Latium, between the country of the Veii
and the Tiber, according to Livy, who places the wood and
temple of Ptonia within its territory. Virgil also mentions
this city, which was near N. of Rome.

CAPENA was also the name of one of the gates of Rome,
now the gate of St. Schaflhann, S.E. of Rome.

CAPENSIS, in Botany, a species of ANOPLA. The
shell is longitudinally ribbed, slightly truncatetl, with round-
figured, transverse reticulae; flat valve, with a two-lobed rib
beneath. C. C. inhabits the Cape of Good Hope. Shell
sometimes reddish, sometimes white.

CAPENSIS, in Botany, a species of PARELA, (Bombyx) that
inhabits Africa. The wings are pale red; on the anterior
pair two fuscos brevius, the posteriure of which is connected
to a black one.

CAPENSIS, a Linnæan species of Cicindela. This kind
is somewhat bavish, with white wing-cases marked with a
three-branched fuscous line. Inhabits the Cape of Good
Hope, and Calabria.

CAPENSIS, a species of Cerambyx, found at the Cape
of Good Hope. The general colour is black; thorax two-
spined; four rufous bands on the wing-cases; antennæ
moderate.

CAPENSIS, a species of Carabus, described by Thun-
berg as a native of the Cape of Good Hope. This is of a
ferruginous colour, with a black longitudinal line on the
thorax and of the wing-cases.

Observe. The abdomen in some specimens is black; in others
brown.

CAPENSIS, in Ornithology, a species of Alauda, that
inhabits the Cape of Good Hope. The three lateral feathers
of the tail are tipped with white; chin pale yellow, edged
with black; eye-brow yellow; capulark, Lathiam; alauda
capita bupi, Brillaon; and emilis icun ou caladur du
cap de bonne esperance, Buffon. The bill is yellowish brown;
upper part of the body with the tail brown; all the feathers
darker in the middle; chin orange; body beneath ochra-
aceous; legs black; back claw rather hooked.

CAPENSIS, a species of Alfas, of a greyish colour, with
cheestnut-coloured back, and speculum spot on the wing
pale greenish blue, edged with white.

This is the Cape pipon of Lathiam. The length is fifteen
inches; bill red, black at the base; head spotted; legs
reddish; claws black. Inhabits the Cape of Good Hope.

CAPENSIS, a species of Zygophyllum. This has the tail long,
and of a cinereous blue colour; beneath fulvous; head
feathery; bill red. Gmel.

This bird inhabits the Cape of Good Hope. Its length is
fourteen inches. The bill is blackish at the tip; head
grey, inclining to tawny; body above blue green, inclining
to ash on the back; legs and claws red. Brillaon calls it
spifieda capitii bupi spis; and Buffon, marit-poecheur du cap de
bonne esperence.

CAPENSIS, a species of Certhia, that inhabits the Cape
of Good Hope. The colour is fulvous; tail-feathers black-
ith, the exterior ones fringed at the outer edges with white.
Brillaon, &c.

CAPER-bean, in Botany. See Zygoophyllum.
CAPER-bush. See Capparis.
CAPER, or CAPPARUS, in Ancient Geography, a river of
8. Afin,
Afa, in Syria, which flowed between the Lycur and Gorgus, and discharged itself into the Tigris. Pliny.—Allo, a river of Asia Minor, in Phrygia, and in the country of Cilantris. Pliny, says that it washed one of the sides of Laodicea, and Strabo informs us, that it discharged itself into the Meander, near that city.

Caper, in Navigation, a vessel used by the Dutch, for cruizing and taking prizes from the enemy. In which sense caper amounts to the same as we use the word, and is used by the Dutch, for a vessel of small burthen, to be employed in the coasting trade.

CAPERNAUM, in Ancient Geography, a town of Palestine, situate on the north side of the sea of Tiberias, called also the lake of Gennesareth and Sea of Galilee, at some distance west from the mouth of Jordan. Although it stood till the seventh or eighth century, its precise situation is quite lost. According to St. Matthew, (iv. 13,) it was on the borders of Zabulon and Nephtali; and it was celebrated as the place where Christ dwelt after having his family at Nazareth, and where he performed many miracles, which occasioned the woe denounced against its inhabitants for their impiety. Capernaum was also the name of a river and of a mountain in the vicinity of the town. It had also a spring of clear and limpid water, which might probably induce the Jews, after their return from the Babylonish captivity, to build a city near it.

CAPERLANS, in Ecclesiastical History, a congregation of religious in Italy, so called from Peter Caperole their founder, in the 15th century. Caperoles having by his enterprising spirit and influence separated the convents of Brescia, Bergamo, and Cremona, from the province of Milan, a law was sent from the vicar-general and these convents enquifed, which terminated in their favour. In 1475, pope Sixtus IV. erected them into a distinct vicariate under the title of that of Brescia. Caperoles afterwards induced the Doge of Venice to erect this vicariate into a congregation, distinguished by his own name. It still subsists, and comprehends 24 convents, situate in Brescia, Bergamo, and Cremona.

CAPES, of Capez, in Geography. See GAB.

CAPESTANG, a town of France, in the department of Hauralt, and chief place of a canton, in the district of Beziers; 3 leagues N. of Narbonne. The place contains 1,359, and the canton 15,077 inhabitants; the territory comprehends 2,474,000 square kilometres, and 9 communes.

CAPET, Hugh, in Biography, the first king of France of the third race, was the son of duke Hugo, surnamed the Great, who, without wearing the crown, had for the better part of his life held the supreme power in France, and who died A. D. 955, by Hadwiga, or Avoya, of Saxony, daughter to Henry the Fowler, king of Germany, father to the emperor Otto the Great, and to Gerberge queen of France. Dante, in his “Purgatory,” (Canto 29) in order to be revenged on prince Charles of Valois, sprung from this prince, for drawing him from Florence, and confounding his property, when heheaded one of the factions of the city, traduced his family by representing him to be the son of a butcher. This ridiculous calumny has been adopted and circulated by several writers on the authority of Dante. Whereas his father was the son of king Robert, who fixed the Normans in France, brother-in-law to three kings, viz. Rodoiph, Athelstan, and Otto the Great, and defended by his mother from Charlemagne. As to the surname of “Cape,” it was most probably a nick-name, signifying literally “jolterhead,” and metaphorically, a “weak,” or an “obliviate” man. In the bulk of these fables it was applied to Charles the Simple, and, perhaps, in the latter sense, to this prince in his youth. At the death of his father he was 16 years of age, and he was particularly recommended to the care of Richard, duke of Normandy. When the line of Charlemagne, which had possessed the throne between 230 and 240 years, terminated with Lewis V. the last monarch of that line, Hugh Capet, who had served him faithfully during his reign, succeeded him; the crown, as some writers affirm, having been bequeathed to him by Lewis in recompense of his services. However this be, upon the death of the king Hugh Capet took early and effectual measures for securing the throne; as in a few days he caused himself to be proclaimed king at Noyon, and was solemnly crowned at Rheims, by the archbishop of that see, on the 3d of July, A. D. 987. This design was executed without opposition, nor did any person exert himself in behalf of the late king's uncle Charles, the last surviving prince of the race of Charlemagne. On his accession, he added greater strength to the crown than he received from it; since the duked of France, the countries of Paris and Orleans, were in his own hands, and his brother-in-law, the duke of Normandy, was closely attached to his interest. His own queen Adelaide, who is said to have been a princess of high birth and admirable qualities, contributed in no small degree to his security. Having defeated an army raised by William duke of Guienne, in a short but bloody battle near Poitiers, he compelled him to submit; and being a man of good temper and sagacity, as well as of great moderation, he assembled the nobles and proposed to them the association of his son Robert. The proposal being accepted, Robert was crowned with great ceremony on new-year’s day, A. D. 988, at Orleans, by the archbishop of Sens. Having, by this act, secured the crown to his family, he never afterwards wore the royal ornaments, or affected any extraordinary state or magnificence; but administered public affairs with great application, and with such an appearance of modesty, justice, and piety, as recommended him highly to his subjets, and more especially to the clergy, to whom he restored all the abbeys in his possession; and his example was followed by the nobility. In the following year the adherents of Charles of Lorrein, after an unsuccessful contest, did homage to the kings Hugo and Robert. The duke Lorrein remained, as long as he lived, a prisoner at Orleans; and with his son, who enjoyed the duchy of Lorrein, and who died without male issue, A. D. 991, the male line of Charlemagne was entirely extinct. In the sequel of his reign, Hugh Capet strengthened his government by mildness and moderation, and had the singular honour of establishing a new family, and in some measure a new form of administration, without any remarkable circumstances of violence, and without shedding blood. He died on the 24th of October, A. D. 997, in the 57th year of his age, and in the 8th of his reign, leaving his dominions in perfect tranquillity, and his son Robert in the peaceable possession of the crown. His remains were interred in the church of the abbey of St. Denis. The devastations of Hugh Capet governed the kingdom of France, in a direct line from father to son, terminating with Charles IV. surnamed the “Fair,” for eleven generations. There were thirteen monarchs in all, whose reigns together make upwards of 350 years, during which interval they wonderfully extended their authority as well as their dominions; and recovered, either to the crown or to the princes of the royal family, the better part of the ancient kingdom of France. They had also reduced the exorbitant power of the nobility within bounds, and were much less dependent upon the clergy than the monarchs of the second race. Yet, after all, the nation was in low circumstances; the frame of government far from being uniform;
form; and, in short, the seeds of those disorders were very perceptible to discerning persons, which, in the succeeding reign, sprang up and became visible to the whole world in their dismal effects. Gen. Dict. Mod. Un. Hist. vol. xix. and xx.

CAPH, a Jewish measure of capacity, estimated by Kim-chi at the 3d part of the log, by Arbrout at the 19th part of the hin, or 32d of the fah, amounting to five-eighths of an English pint. The cap does not occur in Scripture as the name of any measure.

CAPHAR, a toll, or duty, imposed by the Turks on the Christian merchants, who carry or send merchandise from Aleppo to Jerusalem.

The caphars were first settled by the Christians themselves, when masters of the Holy Land, for the support of troops and forces posted in the more difficult passageways, to watch the Arabs, and prevent their pillages. But the Turks, who have continued, and even raised the toll, abuse it; exacting arbitrary sums of the Christian merchants and travellers, on pretence of guarding them from the Arabs: with whom they yet frequently keep an understanding, and even favour their robberies.

CAPHAR, Heb. denoting a field or village, in Ancient Geography, is often used, in composition with other words, to signify a particular town or city. Thus, Caphar-Aria, a village of Palestine, between Jerusalem and Searon:—Caphar-Barica, or Caphar Baruca, a village of palestine, 3 miles from Hebron, in the tribe of Judah, mentioned by Epiphanius and Jerome:—Caphar-Dagon, situated between Dipolis and jamnia:—Caphar-Nimra, a populous town of Palestine, in the land of Ifrad:—Caphar-Neme, a village of Palestine, in Galilee, near Jordan:—Caphar-Ora, a town of Iduma, placed by Ptolomy to the west of Jordan:—Caphar-Saba, the site of Anthipatris, which fee:—Caphar-Samala, a place near Jerusalem:—Caphar-Serek, a town of Palestine, near Eleutheropolis, which existed in the time of Jerome.

CAPHARA, a town of Judah, in the tribe of Benjam. Caphara, a fortified village of Galilee, Josephus.

CAPHARCOTIA, or Capharcotia, a town of Palestine in Galilee, between Scythopolis and Caesarea of Palestine.

CAPHAREUS, a promontory of the island of Eubeas, the doubling of which was reckoned very dangerous, in the infancy of navigation, on account of the rocks and whirlpools on that coast, much spoken of by the ancients. It is now called Capo d'Oro, Capo Chimi, and Capo Figera. On this coast the Grecian fleet was shipwrecked on its return from Troy with Agamemnon. To this purpose Virgil says (A. Encid. l. xvi. v. 260.):—

"Sit triste Minervae
Sidus, et Euboeicae cautes, ultorque Caphareus."

CAPHAS, a mountain of interior Libya, situated in that part of Africa which is about the 15th degree of N. latitude, and 25th degree of E. longitude, whence, according to Ptolomy, the river Daractus arose, supposed by some to be the present Seneal, and from which, it is conjectured, the Levant wind, called the Harmattan, proceeds. See Harmattan.

CAPHESA, or Capsa, a town of Africa, near the source of the river Magrada, surrounded by dactyrs. Ptol. and Strabo.

CAPHÉ, or Caphya, a town of Peloponnesus in Arcadia, N.W. of Orchomenus; it was built by Caphus, and peopled from Attica. In this city were temples of Neptune and Diana. It suffered much from the enterprises of Cleomenes and the Achaean league. Near it was a fountain shaded by a plantain tree of extraordinary beauty, said to have been planted by Menelaus, when he came into Arcadia to raise troops for his Trojan expedition. In the time of Pausanias an antiquity of 1562 years was ascribed to this tree. Thuc. (i. xvi.) says, that it was planted by Agamemnon.

CAPHITOR, an island or district, concerning the situation of which Scripture interpreters have differed. Some have supposed, without sufficient reason, that it was Cappadocia. Others are of opinion, that the island called Caphtor, from which sprung the Capthorim, Cherethites, or Philistines, who are thought of the sale of the fame origin, was the selfie of Crete in the Mediterranean. The able Finche, Dr. Welsby, and others, with greater probability, suppose Caphtor to have been one of the islands formed by the Nile in Egypt, and that it was the same with Capos, which was so situated. To this purpose it is alleged, that the Capthorim, mentioned Gen.x.14 were descendants of Mizraim, the son of Ham, who peopled Egypt; and from them sprung the Philistines.

CAPHURA, the same with Camphor, which fee.

CAPI-AGA, or CAPI-AGAS, a Turkish officer, who is governor of the gates of the seraglio; or grand master of the seraglio. The capi-aga is the first dignity among the white eunuchs: he is always near the person of the grand signior; he introduces ambassadors to their audience: nobody enters, or goes out of the grand signior's apartment, but by his means. His office gives him the privilege of wearing the turban in the seraglio, and of going every where on horseback. He accompanies the grand signior to the apartment of the sultanas, but stops at the door without entering. His appointment is very moderate; the grand signior bears the expence of his table, and allows him at the rate of about sixty French livres per day; but his office brings him in abundance of presents; no affair of consequence coming to the emperor's knowledge, without passing through his hand. The capi-aga cannot be bailwhaw when he quits his post.

CAPIAS, in Law, a writ or process, which is of two sorts; one before judgment, in the court of C. P. called Capias ad respondendum, where an original is found out, &c. to take the defendant and make him answer the plaintiff. The other is a writ of execution after judgment, which is of various kinds; as, Capias ad satisfactendum, Capias pro fine, Capias ulteriorem, &c.

The Capias ad respondendum in C. B. is drawn from the "precipe," which serves both for the "original" and "cipias," and the return of the original is the title of the "cipias." If a "cipias" be special, in cafe, covenant, &c. the cause of action must be recited at large, and the substance of the intended declaration set forth, as also in the original. The "cipias" is a writ commanding the sheriff to take the body of the defendant, if he may be found in his bailwark or county, and to keep him safely, so that he may bring him to court, on the day of the return, to answer to the plaintiff of a plea of debt, trespass, &c. In cases of injury accompanied with force, the law, to punisb the breach of the peace, and to prevent its disturbance for the future, provided a process against the defendant's person, in case he neglected to appear on the process of attachment against his goods, or had no subsistence by which to be attached, subjecting by this writ his body to imprisonment. 3 Rep. 12. But the immunity of the defendant's person, in case of peaceable though fraudulent injuries, producing great contempt of the law in ingent wrong-doers, a "cipias" was also allowed to arrest the person in actions of "account," though no breach of the peace be frustrated, by the flats. of Marlbridge, 2 & Hen. III. 12, and Welf. 3 & 4 Edw. I. c. 13. In actions of "debt" and "definie," by flat. 25 Edw. III. c. 17: and in all actions "on the cafe," by flat. 19 Hen. VII. c. 9.
Before this last statute a practice had been introduced of commencing the suit by bringing an original writ of trespass, "quae clausum frigit," for breaking the plaintiff's close, "vi et armis;" which by the old common law subjected the defendant's person to be arrested by writ of "capias;" and then afterwards, by convirement of the court, the plaintiff might proceed to prosecute for any other lefs forcible injury. This practice (through culum rather than necessity, and for saving some trouble and expense, in fining out a special original, adapted to the particular injury) still continues in almost all cases, except in actions of debt; though now, by virtue of the statute above cited, and others, a "capias" might be had upon almost every plea of complaint. It is now usual in practice, to finely out the "capias" in the first instance, upon the suppos'd return of the sheriff (that the defendant, being summoned or attached, made default, or that he had no substance by which to be attached); especially if it be supposed that the defendant, upon notice of the action, will abscond; and afterwards a fictitious original is drawn up, if the party is called upon to do, with a proper return thereupon, in order to give the proceedings a colour of regularity. When this "capias" is delivered to the sheriff, he by his under-sheriff grants a warrant to his inferior officers, or bailiffs, to execute it upon the defendant. If the sheriff of the county, in which the injury is supposed to be committed, and the action is laid, cannot find the defendant in his jurisdiction, he returns "non est inventus;" whereupon another writ issues, called a "teftatum capiatis," directed to the sheriff of the county where the defendant is supposed to reside, reciting the former writ, and that it is testified "teftatum efi," that the defendant lurks or wanders in his bailiwick, wherefore he is commanded to take him, as in the former "capias." But in a case of this kind also, it is usual, for saving trouble, time, and expense, to make out a "teftatum capiatis" at the first; supposing not only an original, but also a former "capias" to have been granted. This action, being beneficial to all parties, is readily acquiesced in, and is now become the settled practice. But where a defendant absconds, and the plaintiff would proceed to an outlawry against him, an original writ must then be filed out regularly, and after that a "capias." And if the sheriff cannot find the defendant upon the former writ of "capias," and returns "non est inventus," there issues out an "alias" writ, and after that a "pluries," to the same effect as the former; only after these words, "we command you," this clause is inserted, "as we have formerly," or "as we have often commanded you;" "sic aliis, or sic pluries, precipimus." In the King's bench, the bill of Middlesex is a kind of "capias." See Bill of Middlesex.

"A capias" is also used in criminal, as well as in civil, cases. The proper process on an indictment for any petty misdemeanor, or on a penal statute, is a writ of "venire facias," which is in the nature of a summons to cause the party to appear. If by the return to such "venire" it appears, that the party hath lands in the county, whereby he may be detained, then a "diffinis infersus" shall be ifined from time to time till he appears. But if the sheriff returns that he hath no lands in his bailiwick, then (after his non-appearance) a writ of "capias" shall issue, which commands the sheriff to take his body, and have him at the next assizes, and if he cannot be taken upon the first "capias," a second and a third shall issue, called an "alias," and a "pluries capias." But on informations for treason or felony, a "capias" is the first process; and, for treason or homicide, only one shall be allowed to issue, or two in the case of other felonies, by flat. 25 Edw. Ill. c. 14; though the usafe is to issue only one in any felony; the provisions of this statute being in most cases found impracticable. Also, in the case of misdemeanors, it is now the usual practice for any judge of the court of King's-bench, upon certificate of an indictment found, to award a writ of "capias" immediately, in order to bring in the defendant. But in this, and also in civil cases, if he absconds, and it is thought proper to pursue him to outlawry, greater exactness is necessary. Blackft. Com. v. iii. 232, &c. v. iv. p. 318, &c.

"Capias ad satisfaciendum," commonly termed CA. SA., is a writ of execution after judgment; lying where a man recovers in an action personal, as for debt, damage, &c. in which cases, this writ issues to the sheriff, commanding him to take the body of the defendant, whom the debt is recovered; who is to be kept in prison till he make satisfaction.

It is usual to take out this writ, where the defendant hath no lands nor goods, whereof the debt recovered may be leved: and when the body is taken upon a CA. SA., and the writ is returned and filed, it is an absolute and perfect execution against the defendant, and no other execution can be had against his lands and goods. But this is unles the defendant escape, or die in execution, &c. for where a person dies in execution, his lands and goods are liable to satisfy judgment, by flat. 21 Jac. I. c. 24. Rol. Abr. 904. This writ does not lie against any privileged persons, peers, or members of parliament; nor against executors or administrators (except on a "devallavit" returned by the sheriff, 1 Litt. 250; nor against such other persons as could not originally be held to bail. It may be issued out for costs, against a plaintiff as well as a defendant, when judgment is had against him. If the defendant cannot be taken upon a CA. SA. in the county where the act is laid, there may issue a "teftatum" CA. SA. into another county, and so of the other writs.

Capias pro fine. When judgment is given for the plaintiff, it is considered that the defendant be either aimerd, for his wilful delay of justice in not immediately obeying the king's writ by rendering the plaintiff his due; or be taken up, "capiatur" till he pays a fine to the king for the public misdemeanour which is coupled with the private injury, in all cases of force, of falsehood in denying his own deed, or unjustly claiming property in replevin, or of contempt by disobeying the command of the king's writ or the express prohibition of any statute. But now in case of trespass, ejectment, assault, and false imprisonment, it is provided by 5 & 6 W. & M. c. 12., that no writ of "capias" shall issue for this fine, nor any fine be paid; but the plaintiff shall pay 6s. 8d. to the proper officer, and be allowed it against the defendant among his other costs. And, therefore, upon such judgments in the Common Pleas they used to enter that the same was remitted; and now in both courts they take no notice of any fine or "capias" at all. Blackft. tom. v. iii. p. 398.

"Capias ultagatum," a writ which lies against one outlawed upon any action, personal or criminal; by which the sheriff is ordered to apprehend the party outlawed, for not appearing on the exigtent, and keep him in false custody till the day of return; when he is to present him to the court, to be there further dealt with for his contempt: who, in the Common Pleas was formerly to be committed to the Fleet, and to remain there till he had freed out the king's pardon, and appeared to the action. By a special "Capias ultagatum" (against the body, lands, and goods in the same writ) the sheriff is commanded to seize all the defendant's lands, goods, and chattels, for the contempt to the king; and the plaintiff, (after an inquisition taken thereupon, and returned into the exchequer) may have the lands extended, and a grant of the goods, &c. whereby to compel the defendant to appear; when which he doth, if he revere
rever the outlawry, the same shall be restored to him. Old. Nat. Brev. 154. When a person is taken upon a "capitis
nulagatam," the sheriff's to take an attorney's engagement
appearance to appear for him, where special bail is not required;
and his bond with sureties to appear, where it is required.
Capias in Witternam. See Witternam.
Capias conditator ad professicendam, an original writ, which
lies, by the common law, against any officer who has coven-
anted to serve the king in war, and appears not at the time
and place appointed. It is directed to two of the king's serjeants at arms, to arrest and take him wherever he may be found: and to bring him coram comitatu nifi, with a clause of discharge.
Capiatur, judgment quad. See Capias pro fine.
Capibara. See Capybara.
Capiculy, formerly called Janizaries, the first and
best corps or body of the Turkish infantry.
Capidava, in Ancient Geography, a town of Lower
Illyria, between Axiospolis and Carfion. Antonin. Hin.
Capidodius, in Zoology, a name given by Paulus
Javius, and some other obsolete writers, to an animal of the
ceratoe tribe (or fowl as they describe it) distinguished by
having the fowl bending upwards, and armed with broad
furred teeth. The species implied is certainly Delphinus
Orca of Linnæus and later authors.
Capidolia, in Zoology, a synonym of Balea
Musculus.
Capigl, or Capigdi, a porter, or door keeper of the
Turkish Seraglio. There are about five hundred capigis,
or porters, in the Seraglio, divided into two companies;
one consisting of three hundred, under a chief called
Capigii-Baffa, who has a flippend of three ducats per day;
the other consists of two hundred, distinguished by the
name of Buccadigoli, and their chief Buccadiggi-Baffa,
who has two ducats. The capigis have from seven to fifteen
alpers per day: some more, others less. Their business is
to affil the janizaries in the guard of the first and second
gates of the Seraglio; sometimes all together; as when
the Turk holds a general council, receives an embassador,
or goes to the mosque; and sometimes only in part; be-
ing ranged on either side to prevent people entering
with arms, any tumults being made, &c.
The word, in its original, signifies gate.
Capigis-bachi, or Capigis-lachi, a fort of chamber-
buildings belonging to the grand signior whose place is ho-
nourable and lucrative, and who are charged to execute the
orders which they receive from the sultan, e.g. to cut off the
head of a rebel or extortioner, to carry the news of the
appointment to a government, to go and collect the succes-
sions of the great officers of the empire, &c.; their chief, al-
tways taken from this class, is called "Mir-alem." The
Capigis-bachi are sometimes raised to the dignity of pacha
or bakhaw with two tails, and go in that quality to govern
the province which is allotted to them.
Capillaire, a synap made of maiden-hair. See
Adiantum and Asplenium.
Capillament, literally signifies hair, being formed of
the Latin capillus, of caput, q. d. hair of the head. Hence
the word is figuratively applied to several things, which,
on account of their length, or their fineness, resilient hairs: as,
Capillaments of the nerves, the fine fibres, or fila-
ments, whereof the nerves are composed.
Capillament, in Botany, a term used by the old bot-
anists for the filament of the flamen. Bradley terms it to re-

Brain capillaments to the smaller flowers; and stamina (which he corruptly calls apice) to the larger.
Capillament is also applied to the fibrings or threads
about the roots of plants.
Capillaries, a name given by some of the old botanists to the flava, because, according to Mr. Ray, they
strengthen and improve the human hair; or, according
to others, from a curious fancy that they grow from
the earth without flumes, in the same manner as hairs grow
from the human head.
Capillaris, or Capillata, Arbor, an ancient
tree at Rome, on which the veilis virgins, when they had
their office, hung up their hair, and consecrated it to the
gods.
Capillary, of the Latin capilus, a hair, is applied
to several things, to intimate their exceeding smallness, or
fineness, resembling that of a hair.
Capillary is also used by Minerals in speaking of
ores which ramify or shoot out fine branches like threads.
In which sense it amounts to the same with what is otherwise called arborscent and flinted. Woodward speaks of
capillary or arborscent silver and iron; Crew describes a
piece of pure capillary copper from the mine of Heragrant,
the several fings or capilli of which are short, of a reddish
golden colour, growing together almost like those of the
little flume-mofs.
Capillary roots. See Fibrous roots.
Capillary tubes, in Physic, are those which are very
small, or whose canals are so narrow, as by the diminutive
deep of their bores to resemble a hair in diameter. The usual
diameter of capillary tubes is a half, third, or fourth of a
line, or from $\frac{1}{100}$ to $\frac{1}{1000}$ of an inch; though Dr. Hook
assures us he drew tubes in the flame of a lamp much smaller,
and almost as fine as the thread of a cobweb.
The ascent of fluids in tubes of this kind is a pheno-
menon which has been noticed by philosophers, and of which
different accounts have been given. The fact is unquestion-
able; for if one end of a small tube, open at both ends, be
immerged in water, the liquor within the tube will rise to a
feasible height above the external surface; or if two or more
tubes be immergec in the same fluid, e.g. water, one of
them a capillary one, and the other considerably larger, the
water will rise perceptibly much higher in the former than in
the latter; in the reciprocal ratio of the diameters of the
tubes: and the effect is the same in vacuo as in the open air.
The greatest height to which Dr. Hook ever found water
to ascend above the level of the bason, in his very small
capillary tubes, did not exceed 21 inches. See Ascent of
fluids.

For the illustration of this phenomenon, we may observe in
general, that the particles of water and of other fluids mu-
tually attract each other; and that there is also an attraction
between glases and water, &c. which is increased by cold,
and diminished by heat, but which is a capillaries paribus,
proportional to the surface of contact. The mutual attraction
of particles of water is evinced by the globular forms of the
drops of this fluid, by their coalescing when brought near
one another, and by a variety of other phenomena. It is
observed also, that if we breathe on a glas plate, the breath
will adhere to it longer in cold, than in hot weather. If a
drop of water be laid upon glases, the surface most remote
from the glases will retain a convex form, whilst that which
touches it will adapt itself to the surface of the glases, and
adhere to it with a certain degree of force; but if the same
drop be spread over the surface of the glases, it will lose its
convex surface, and adhere to the glases with a greater force.

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By this dispersion of its particles they will be removed farther from each other, and their mutual attraction will be diminished; whereas, on the other hand, the attraction between the water and the glass is increased by enlarging the surface of contact. In either of these cases, the water is attracted by the glass only on one side; but if another piece of glass be placed in opposition to the former, and in contact with the film of water, the water will be attracted and retained with a greater force; and if the water be on every side encompassed with glass, or enclosed in a narrow tube, the attraction will become stronger, because the surface of contact in proportion to the quantity of water is thus considerably enlarged. The truth of these observations may be evinced in the following manner. Put water into a glass vessel, (Plate I. Hydrostatics, fig. 1.) and the water near the surface of the glass will ascend, and form a curve, as at A and B; or the same effect will be exhibited at C and D, by dipping part of a piece of glass in the water. In order to explain this effect, let \(A B\), (fig. 2.) represent a section of the surface of a piece of glass, the lower part of which is immersed in the water, B C: and suppose this surface to be divided into a number of indefinitely small parts, \(a, b, c, d, \&c.;\) then the part \(a\), next to the surface of the water, B C, will raise a quantity of water proportional to its attractive force; which quantity is thus brought nearer to the part \(b\) of the glass, and attracted by it, so that another quantity of water takes its place next to \(a\). The first quantity of water being raised to \(b\), is brought nearer to the part \(c\) of the glass, and being attracted by it, is raised to the place \(e\), whilst the first quantity of water \(a\), takes its place, which is succeeded by another quantity of water which rises to the place \(a;\) so of the others. In consequence of this attraction, the water ought to form a film of equal thickness, or the quadrilateral figure, \(g, b, a, s,\) on the whole surface of the glass. But by reason of the mutual attraction of the particles of water towards each other, when the first quantity of water has been raised to the place \(a\), another quantity of water \(s\), is kept suspended by this latter attraction, between the water at \(a\), and that at B C. When the glasses has by its attraction raised the water to \(b,\) the part \(s\) will be extended to \(e,\) because the two quantities of water, \(a\) and \(b,\) can keep suspended a greater portion of water than the single part \(a.\) Thus, the water will ascend along the surface of the glasses, and will remain adhering to it, in such quantity as to form a counterpoise to the attraction of the glass; or, in other words, the preffure of the water thus raised, and the attraction between it and the water, B C, will form by their united actions a counterpoise to the attraction of the glasses. The real ascent of the water, which, in the figure we have referred to, has been enlarged for the better illustration of the subjeét, seldom exceeds \(\frac{1}{2}\)th of an inch, when the glasses is either flat, or not much bent. But this altitude is increased by a variety of circumstances; viz. by the temperature and purity of the water, by the quality of the glases, and chiefly by the polishing and cleanliness of its surface.

In small tubes of different diameters, the perpendicular ascent of water, and of various other fluids, will be in inverse as their respective diameters. Thus, if glas tubes opened at both ends be immersed with their lower apertures in water, (see fig. 3.) the water will instantly rise spontaneously into their cavities; and it has been found to rise higher and with a greater velocity in narrower than in larger tubes, according to the proportion in which the diameters of the larger tubes exceed those of the smaller; and the altitude in a tube of \(\frac{1}{2}\)th part of an inch, (viz. 0.01), in diameter, will be about 5.3 inches. Consequendy, in a tube of 0.02 in diameter, the altitude of the water will be the half of 5.3, viz. 2.65 inches. Also, in a tube whose diameter is 0.1 of an inch, or 12 times 0.01, the altitude of the water will be the 10th part of 5.3, or 0.53 of an inch, &c. Hence it follows, that if we call the diameters of the tubes \(D, d,\) and the altitudes of the water \(A, a,\) we have, \(D : d : a : A,\) and \(A D = ad;\) that is, the product of the diameter by the altitude of the water is always the same, or the constant quantity 0.053 of an inch; for when the diameter is 0.01 of an inch, the water rises to the altitude of 5.3 inches; and 53 x 0.01 is equal to 0.053 = 0.02 x 2.65 = 0.01 x 0.53.

But, therefore, you wish to know how high the water will rise in a tube of a given diameter, it is only necessary to divide 0.053 by the diameter, and the quotient expresses the altitude in inches, very nearly; for allowance must be made for difference of temperature, the nature and cleanliness of the glasses, &c. which influence the altitude. Moreover, since the surface of a cylinder is as the product of the diameter multiplied by the axis, or the altitude, and it has been already shown, that in the part of the tube occupied by the water, the product of the diameter by the altitude is a constant quantity, the surface of the glasses which is in contact with such a pillar of water, is likewise a constant quantity.

Mr. Atwood, in his "Analysis," has given the following method of very accurately determining the diameter of a capillary tube. Put into the tube some mercury, whose weight in grains is \(\omega,\) and let it occupy a length of the tube \(l,\) then, if 136 be the specific gravity of mercury, as it is when in its purest state, that of water being 1, the diameter will be \(\sqrt{\frac{\omega}{l}} \times 0.01923.\) For let \(d\) be the diameter, and the contents of the mercury will be \(d^2 \times \sqrt[3]{7.854} ;\) and as one cubic inch of mercury weighs 3443 grains, we have \(1 \times 3443 = d^2 \times \sqrt[3]{7.854} = \omega;\) hence we shall have \(d^2 \times \sqrt[3]{7.854} = 3443 = \omega = \frac{\omega}{l} \div \sqrt[3]{7.854} ;\) and \(d^2 = \frac{\sqrt[3]{7.854}}{\sqrt[3]{7.854}} = \sqrt[3]{7.854} \div \sqrt[3]{7.854} = \sqrt[3]{7.854} \times 0.01923.\)

Several ingenious persons, who, in examining the phenomena of capillarity, have found that the bulks of the suspended pillars of water are not proportional to the surfaces of glases with which they are in contact, have been embarrassed in explaining them; and for this purpose they have adopted various hypotheses. Some have supposed that the unequal preffure of the air upon the liquor contained in the tube and that in the vessel is the cause of the ascent in the tube. In order to account for this inequality, some have had recourse to the magnitude of the particles of the air and of the ascending fluid; others have conceived, that only an inverted cone of air, touching the surface of the liquor in the tube with its vertex, and having the upper orifice of its tube for its base, could press upon the surface contiguous to its vertex. Dr. Hook supposed that part of the preffure of the air in the tube was taken off by its friction, which he apprehends must necessarily happen against the sides in so narrow a passage, and this hypothesis of Dr. Hook was for a long time very generally received. Those who wish to see his explication of it may find it in the sixth Observation of his "Micrography," or in Cotes's "Hydrostatical and Pneumatical Lectures," (ubi infra.) But since it has
has been observed, that the same effect of liquors in capillary tubes occurs in vacuo as in the open air; this hypothesis of an inequality of pressure has been relinquished; and the solution of the difficulty has been sought for in the mutual attraction of the particles of fluids and the air. Mr. Parkinson, Mr. Hawkisse, and others, have recourse to the attraction of the annulus of the concave surface of the tube. Dr. Jurin (Phil. Trans. N° 255, and N° 373, or Abr. vol. iv. p. 473, &c.) ascribed the suspension of the water to the attraction of the small annular portion, or periphery of the inside of the tube, to which the upper surface of the water is contiguous and adheres; this being the only part of the tube, from which the water must recede upon its subsiding, and consequently, the only one which, by the force of its cohesion and attraction, counteracts the gravity of the water, and opposes its descent. This he shews to be a cause proportional to the effect; because the periphery, and the suspended column, are both in the same proportion as the diameter of the tube. The suspension being thus accounted for, the seemingly spontaneous ascent will be easily solved: for since the water that enters the capillary tube, as soon as its orifice is dipped in it, has its gravity taken off by the attraction of the periphery, with which its upper surface is in contact, it must necessarily rise higher; partly by the preface of the stagnant water, and partly by the attraction of the periphery, immediately above that which is already contiguous to it. Dr. Hamilton (Lect. ii. p. 47, &c.) dissatisfied with the principle adopted by Dr. Jurin and others, supposes that the pillar of water is supported by the attraction of the annulus contiguous to the bottom of the tube. Accordingly, he observes, that when the orifice of a small glass tube, open at both ends, is dipped in water, the small annular surface of glass, on the inside of the tube contiguous to the orifice, will draw up the water lying immediately under it, and every plate of water elevated will raise up that lying above it, until the weight of the column raised counterbalance the force by which this annulus endeavours to draw up more water. The thin plate of water lying over the lowest annulus, and every other plate of the elevated water, must be attracted upwards and downwards with equal forces, because the attracting surfaces above and below it are equal; and therefore the whole column of water, lying above the lowest annulus, being drawn equally in opposite directions, may be considered as unaffected by the attraction of the glass, and must presib with its whole weight on the water retained at the orifice of the tube by the attraction of that lowest annulus, which has no other surface below it to counteract its force. Moreover, when the water has ascended into a small glass tube, open at both ends, take it up, and wiping off the drop hanging at the end of it, invert the tube; the small column of included water, being drawn equally by the glass in opposite directions, will descend by its own gravity, or stop only when it arrives at the lowest orifice. Or, whilst the included column is descending, let the lowest orifice be dipped in water, and taken up, and a small plate of water will be retained at its orifice, and then the included column will be quiescent. Now this column must, by means of the intermediate air, press with its whole weight upon the plate of water at its orifice, which can be retained by no other force than the attraction of the glass annulus, lying just within the orifice of the tube. From hence it appears, says Dr. Hamilton, that this attraction alone is sufficient to sustain, and consequently to raise all the water that rises in glass tubes. Against this reasoning Mr. Parkinson, (ubi infra) has alleged the following experiments. 1. Let a cylindrical glass tube be divided into very small equal annuli, e, f, g, d, c, &c. (fig. 4.) and a be-

ing dipped in water, a thin plate of the fluid will be detached from the mafs, which being now in contact with the second annular surface e, polelles the same power of attraction with a, n, partly at least, be raised by it; and the same will happen with the remaining annuli. And if the efforts of the intermediate annuli should be equal and opposite, which cannot be allowed, yet the superior annulus at g, would be unaffected, and its whole force be transmitted, and it must contribute, at least, towards the support of the column of water. But that each annulus should exert a force in elevating the lamina of fluid contiguous to it, and not contribute towards the support of the fluid thus elevated, is unaccountable; the power of attraction being inherent in the glass, and incapable of it. 2. Let the orifice, F, of the compound tube, EDF, (fig. 5.) be dipped in water; and it will rise to an altitude equal to a b; and if D F be filled, so that the fluid be not in contact with the narrower part, it will subside till its height be equal to a b. But let the tube be filled s, so that the fluid be admitted into the narrower part at D, the height of the column suspended will be equal to a s, though the lowest annulus continues the same. When this tube is inverted, and the orifice, E, dipped in the fluid, it rises to an altitude equal to a s, if the narrower part of the tube be so long; and if E D be less than b s, it rises into the wider tube till its height be equal to b s, the same altitude as if the tubes were cylindrical, and its diameter equal to that of the wider. If these experiments be true, it is clear that the water, rising spontaneously in glass tubes, is neither raised nor supported by the attraction of the lowest annulus.

Others have maintained, and this opinion seems to be the most unexceptionable, that the attraction is proportional to the whole surface of the glass which is in contact with the column of water; for every point or particle of that surface possesses an equal attractive power; and the preface of the suspended water is equivalent to it, or the one is a counterpoise to the other. This influence of glass, and other substances, upon fluids is scarcely perceptible beyond the immediate points of contact; nevertheless, it is clear, that a film of water of a certain thickness must be within the extent of that attractive power all round the inner surface of the tube, as high as the top of the pillar; but the rest of the water, which fills up the cavity of the tube, is attracted to that film, and is kept suspended by it, in consequence of the mutual attraction of the particles of water: yet the whole column is kept up by the attraction of the glass, and is a counterpoise to that force. Let water be kept suspended in the cylindrical glass tube, ABC D, (fig. 6.;) and let the attraction of the glass extend to the lines, E G, F H; and circles of the fluid, whose breadths are m n, r s, &c. will adhere to the surface, and certainly be supported by the immediate attraction of the glass, which is so great, that water suspended in a capillary tube will not evaporate, though exposed to the air for six or seven months: but the intermediate column, E G H F, is only supported by the adhesion of the particles of the fluid to these circles, and to the highest lamina, G H; the attraction of any intermediate lamina, L M, being the same both upwards and downwards; and when the weight of this intermediate column exceeds their accumulated force, it must descend. This seems to be certain, that the shell of particles, C E F D, is sustained by the intermediate action of the glass, which is diffused to the intermediate lamina, n p, q r, &c. by the cohesion of the particles themselves; and in this manner the forces of the opposite points, m q, and r s, conspire, which does not obtain in the forces of the particles upon the outside of the tube; and this seems to be the reason why a column of the fluid is not elevated upon
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By this dispersion of its particles they will be removed farther from each other, and their mutual attraction will be diminished; whereas, on the other hand, the attraction between the water and the glafs is increased by enlarging the surface of contact. In either of these cases, the water is attracted by the glafs only on one side; but if another piece of glafs be placed in opposition to the former, and in contact with the film of water, the water will be attracted and retained with a greater force; and if the water be on every side encompassed with glafs, or enclosed in a narrow tube, the attraction will become stronger, because the surface of contact in proportion to the quantity of water is thus considerably enlarged. The truth of these observations may be evinced in the following manner. Put water into a glafs vessel, (Plate I. Hydrophylax, fig. 1.) and the water near the face of the glafs will ascend, and form a curve, as at A and B; or the same effect will be exhibited at C and D, by dipping part of a piece of glafs in the water. In order to explain this effect, let A B, (fig. 2.) represent a section of the surface of a piece of glafs, the lower part of which is immerfed in the water, BC; and suppose this surface to be divided into a number of indefinitely small parts, a, b, c, d, &c.; then the part a, next to the surface of the water, BC, will raise a quantity of water proportional to its attractive force; which quantity is thus brought nearer to the part b of the glafs, and attracted by it, so that another quantity of water takes its place next to a. The first quantity of water being raised to b, is brought nearer to the part c of the glafs, and being attracted by it, is raised to the place e, whilst the first quantity of water a, takes its place, which is succeeded by another quantity of water which rises to the place a; so of the others. In consequence of this attraction, the water ought to form a film of equal thicknesses, or the quadrilateral figure, g, b, a, s, on the whole surface of the glafs. But by reason of the mutual attraction of the particles of water towards each other, when the first quantity of water has been raised to the place a, another quantity of water s, is kept suspended by this latter attraction, between the water at a, and that at BC. When the glafs has by its attraction raised the water to b, the part s will be extended to t, because the two quantities of water, a and b, can keep suspended a greater portion of water than the single part a. Thus, the water will ascend along the surface of the glafs, and will remain adhering to it, in such quantity as to form a counterpoise to the attraction of the glafs; or, in other words, the preffure of the water thus raised, and the attraction between it and the water, BC, will form by their united actions a counterpoise to the attraction of the glafs. The real ascents of the water, which, in the figure we have referred to, has been enlarged for the better illustration of the subject, seldom exceed about 1/25th of an inch, when the glafs is either flat, or not much bent. But this altitude is increafed by a variety of circumstances; viz. by the temperature and purity of the water, by the quality of the glafs, and chiefly by the polish and cleanliness of its surface.

In small tubes of different diameters, the perpendicular ascent of water, and of various other fluids, will be inversely as their respective diameters. Thus, if glafs tubes opened at both ends be immured with their lower apertures in water, (see fig. 3.) the water will instantly rise spontaneously into their mincy cup, and it has been found to rise higher in a greater velocity in narrower than in larger tubes, according to the proportion in which the diameters of the larger tubes exceed those of the smaller; and the altitude in a tube of about 5 3 inches. Correspondingly, in a tube of 0.02 in diameter, the altitude of the water will be the half of 5.3, viz. 2.65 inches. Also, in a tube whose diameter is 0.1 of an inch, or 100 times 0.01, the altitude of the water will be the 10th part of 5.3, or 0.53 of an inch, &c. Hence it follows, that if we call the diameters of the tubes D, d, and the altitudes of the water A, a, we shall have, D : d :: a : A, and D x A = a : D that is, the product of the diameter by the altitude of the water is always the same, or the constant quantity 0.053 of an inch; for when the diameter is 0.01 of an inch, the water rises to the altitude of 5.3 inches; and 5.3 x 0.01 is equal to 0.053 = 0.02 x 2.65 = 0.01 x 0.53. If, therefore, you wish to know how high the water will rise in a tube of a given diameter, it is only necessary to divide 0.053 by the diameter, and the quotient expresses the altitude in inches, very nearly; for allowance must be made for difference of temperature, the nature and cleanliness of the glafs, &c. which influence the altitude. Moreover, since the surface of a cylinder is as the product of the diameter multiplied by the axis, or the altitude, and it has been already shown, that in the part of the tube occupied by the water, the product of the diameter by the altitude is a constant quantity, the surface of the glafs which is in contact with such a pillar of water, is likewise a constant quantity.

Mr. Atwood, in his "Analysis," has given the following method of very accurately determining the diameter of a capillary tube. Put into the tube some mercury, whose weight in grains is w, and let it occupy a length of the tube l: then, if 13.6 be the specific gravity of mercury, as it is when in its pure flat state, that of water being 1, the diameter will be \[ \sqrt{\frac{w}{l}} \times 0.1923. \] For let d be the diameter, and the contents of the mercury will be \( d^2 \times 7.854 \) and as one cubic inch of mercury weighs 3443 grains, we have \( 1 \times 3443 = d^2 \times 7.854 = w \); hence we shall have \( d^2 = \frac{w}{7.854} = \frac{1}{3443} \). Therefore, \( d = \sqrt{\frac{w}{7.854}} \), and \( d^2 = \sqrt{\frac{1}{3443}} \). And \( \sqrt{\frac{w}{l}} \times \sqrt{\frac{1}{2704.1332}} = \sqrt{\frac{w}{l}} \times \sqrt{\frac{1}{2704.1332}} \times \sqrt{\frac{1}{2704.1332}} = \sqrt{\frac{w}{l}} \times 0.1923. \)

Several ingenious persons, who, in examining the phenomena of capillary attraction, have found that the bulks of the suspended pillars of water are not proportional to the surfaces of glafs with which they are in contact, have been embarrased in explaining them; and for this purpose they have adopted various hypotheses. Some have supposed that the unequal preffure of the air upon the liquor contained in the tube and that in the vessel is the cause of the ascent in the tube. In order to account for this inequality, some have had recourse to the magnitude of the particles of the air and of the ascending fluid; others have conceived, that only an inverted cone of air, touching the surface of the liquor in the tube with its vertex, and having the upper orifice of its tube for its base, could pres upon the surface contiguous to its vertex. Dr. Hook supposed that part of the preffure of the air in the tube was taken off by its friction, which he apprehends must necessarily happen against the sides in so narrow a passage; and this hypothesis of Dr. Hook was for a long time very generally received. Those who wish to see his elusion of it may find it in the 6th Observation of his "Micrography," or in Cotes's Hydrodynamical and Pneumatical Lectures, "ubi infra." But since it has
has been observed, that the same sacci of liquors in capillary tubes occurs in vacuo as in the open air; this hypothesis of an inequality of pressure has been relinquished; and the solution of the difficulty has been sought for in the mutual attraction of the particles of fluids and those of glafs. Mr. HawkbeC, and others, have recourse to the attraction of the annulus of the concave surface of the tube. Dr. Jurin (Phil. Trans. No. 555, and No. 573, or Atr. vol. iv. p. 473, &c.) described the suspension of the water to the attraction of the small annular portion, or periphery of the inside of the tube, to which the upper surface of the water is contiguous and adheres; this being the only part of the tube, from which the water must recede upon its fulfulness, and consequently, the only one which, by the force of its cohesion and attraction, counteracts the gravity of the water, and opposes its descent. This he shews to be a cause proportional to the effect; because the periphery, and the suspended column, are both in the same proportion as the diameter of the tube. The suspension being thus accounted for, the seemingly spontaneus accent will be easily solved: for since the water that enters the capillary tube, as soon as its orifice is dipped in it, has its gravity taken off by the attraction of the periphery, with which its upper surface is in contact, it must necessarily rise higher; partly by the preface of the lagant water, and partly by the attraction of the periphery, immediately above that which is already contiguous to it. Dr. Hamilton, (Lett. ii. p. 47, &c.) dissatisfied with the principle adopted by Dr. Jurin and others, supposes that the pillar of water is supported by the attraction of the annulus contiguous to the bottom of the tube. Accordingly, he observs, that when the orifice of a small glafs tube, open at both ends, is dipped in water, the small annular surface of glafs, on the inside of the tube contiguous to the orifice, will draw up the water lying immediately under it, and every plate of water elevated will raise up that lying above it, until the weight of the column raised counterbalance the force by which this annulus endeavours to draw up more water. The thin plate of water lying over the lowest annulus, and every other plate of the elevated water, must be attracted upwards and downwards with equal forces, because the attracting surfaces above and below it are equal; and therefore the whole column of water, lying above the lowest annulus, being drawn equally in opposite directions, may be considered as unaffected by the attraction of the glafs, and must pres with its whole weight on the water retained at the orifice of the tube by the attraction of that lowest annulus, which has no other surface below it to counteract its force. Moreover, when the water has ascended into a small glafs tube, open at both ends, take it up, and wiping off the dip hanging at the end of it, invert the tube; the small column of included water, being drawn equally by the glafs in opposite directions, will depend by its own gravity, or stop only when it arrives at the lowest orifice. Or, whilst the included column is descending, let the lowest orifice be dipped in water, and taken up, and a small plate of water will be retained at its orifice, and then the included column will be quiescent. Now this column must, by means of the intermediate air, pres with its whole weight upon the plate of water at its orifice, which can be retained by no other force than the attraction of the glafs annulus, lying just within the orifice of the tube. From hence it appears, says Dr. Hamilton, that this attraction alone is sufficient to sustain, and consequently to raise all the water that rises in glafs tubes. Against this reasoning Mr. Parkinson (ubi infra) has alleged the following experiments. 1. Let a cylindrical glafs tube be divided into very small equal annuli, $a, b, c, d, e, &c.$ (fig. 4.) and a be

ing dipped in water, a thin plate of the fluid will be detached from the mafs, which being now in contact with the second annular surface $b$, positfes the same power of attraction with $a$, mainly at least, be raised by it; and the same may be observed in the case of the annuli with the remaining annuli. And if the efforts of the intermediate annuli should be equal and opposite, which cannot be allowed, yet the upper annuli at $g$, would be unaffected, and its whole force remain, and it must contribute, at least, towards the support of the column of water. But that each annulus should exert a force in elevating the lamina of fluid contiguous to it, and not contribute towards the support of the fluid thus elevated, is unaccountable; the power of attraction being inherent in the glafs, and inerasable from it. 2. Let the orifice, $F$, of the compound tube, $E D F$, (fig. 5.) be dipped in water, and it will rise to an altitude equal to $g b$; and if $D F$ be filled, so that the fluid be not in contact with the narrower part, it will subside till its height be equal to $g b$. But let the tube be filled so that the fluid be admitted into the narrower part at $D$, the height of the column suspended will be equal to $a$, though the lowest annulus continues the same. When this tube is inverted, and the orifice, $E$, dipped in the fluid, it rises to an altitude equal to $a$, if the narrower part of the tube be so long; and if $E D$ be less than $b g$, it rises into the wider tube till its height be equal to $b g$, the same altitude as if the tubes were cylindrical, and its diameter equal to that of the wider. If these experiments be true, it is clear that the water, rising spontaneously in glafs tubes, is neither raised nor supported by the attraction of the lowest annulus.

Others have maintained, and this opinion seems to be the most unexceptionable, that the attraction is proportional to the whole surface of the glafs which is in contact with the column of water; for every point or particle of that surface possesses an equal attractive power; and the preface of the suspended water is equivalent to it, or the one is a counterpoise to the other. This influence of glafs, and other substances, upon fluids is scarcely perceptible beyond the intermediate points of contact; nevertheless, it is clear, that a film of water of a certain thickness must be within the extent of that attractive power all round the inner surface of the tube, as high as the top of the pillar; but the rest of the water, which fills up the cavity of the tube, is attracted to that film, and is kept suspended by it, in consequence of the mutual attraction of the particles of water: yet the whole column is kept up by the attraction of the glafs, and is a counterpoise to that force. Let water be kept suspended in the cylindrical glafs tube, $A B C D$, (fig. 6;) and let the attraction of the glafs extend to the lines, $E G, F H$; and circles of the fluid, whose breadths are $m n, r s, &c.$ will adhere to the surface, and certainly be supported by the intermediate attraction of the glafs, which is so great, that water suspended in a capillary tube will not evaporate, though exposed to the air for six or seven months: but the intermediate column, $E G H F$, is only supported by the adhesion of the particles of the fluid to these circles, and to the highest lamina, $G H$; the attraction of any intermediate lamina, $L M$, being the same both upwards and downwards; and when the weight of this intermediate column exceeds their accumulated force, it must descend. This seems to be certain, that the shell of particles, $C E F D$, is sustained by the intermediate attraction of the glafs, which is diffused to the intermediate lamina, $p q, r s, &c.$ by the cohesion of the particles themselves; and in this manner the forces of the opposite points, $m q$, and $r s$, confpire, which does not obtain in the forces of the particles upon the outside of the tube; and this seems to be the reason why a column of the fluid is not elevated upon
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upon the outside, as it is within. Upon the whole it appears, that the pressure of the column of water in the tube is equivalent, or it is a counterpoise, to the attractive force of the surface of the glass, which is in contact with it; and of course it is proportional to that surface. But if we omit the quantity of that counterpoise, or of the pressure of the column of water, we must take into the account not only the quantity, but also the altitude; because, ceteris paribus, fluids prefs in proportion to their perpendicular altitudes; and when the base varies, as in different cylindrical pillars, the preffures are as the products of the quantity of matter by the altitude of each pillar respectively. Therefore the pressure of the pillar of water in a glass tube, which is a counterpoise to the attraction of the glass, is the product of the quantity of water by the altitude; and in cylindrical tubes, this product is always proportional to the surface of glass in contact with water. Having already shown, that this surface is a constant quantity, it follows, that the product of the quantity of water by the altitude of the pillar must likewise be a constant quantity; since it is as the above-mentioned surface. In order to illustrate this by an example; let the inside of the diameter of a tube, B C, (fig. 7.) be double that of the tube, D F; then the pillar of water, E F, will be two inches high when the pillar, A C, is one inch high. Since the contents of cylinders of the same altitude are as the squares of their respective diameters, and their surfaces are as their diameters, it is easily calculated that if the quantity of water in the pillar, E F, weighs two grains, that of A C will weigh four grains; and likewise that the surface of glass in contact with the pillar of water, E F, is equal to the surface of glass which is in contact with the pillar of water, A C; hence it should seem that those equal surfaces ought to keep suspended equal quantities of water; whereas the quantity of water, E F, is the half of the quantity of water, A C; but the height of the pillar of water, E F, is double that of the pillar, A C; and consequently, its pressure, which is equal to the product of the quantity of water by the altitude (viz. two grains by two inches) is equal to the pressure of the column, A C, viz. the product of four grains by one inch.

If a tube confluent of two cylinders, one E F, (fig. 8.) whose diameter is equal to that of the tube, A B, in which the water would rife to the height A B, and the other, a larger part, C D, whose diameter is equal to that of the tube, G H, in which the water would rife to the height G H; and if this compound tube be placed with the narrow aperture in water, as at F, the water will not rife in it higher than the altitude G H, i.e. to the same altitude to which it would rife if the tube were an uniform cylinder of the diameter of the large part. It might, indeed, he expected, that the water would rife higher than D, G; but it must be considered that though the product of the pillar of water, E F, by its altitude is less than a just counterpoise to the attraction of the surface, E F, of the glass; yet the excess of attraction of that surface, instead of aiding to support the water in C E, will operate in a contrary way: that is, if we flate the attraction of the surface, E F, equal to 10, and if the preffure of the pillar of water in it be equal to 8; then the two remaining parts of attractive power will tend to draw the water from the bafoon as much as from the cavity, D E, towards the surface, E F; so that by the addition of the narrow tube, E F, the attraction of the larger part, D I, is diminished; at the same time that the water in it is partially supported by what may be called its perforated bafe, E I.

If a compound tube confluent of a larger part, L N, (fig. 8.) in which the water would rife spontaneously to the altitude, M, and of a narrower part, O K, equal in diameter to the tube, A B, in which the water would rife to the height A B, be filled with water as high as K, and then be placed with the large aperture in water as at N, the whole quantity of water will remain suspended; filling the whole of the large tube and part of the narrow one. The same thing will also take place with a vesel of any shape, as P Q S; provided its upper part be drawn into a narrow cylinder equal in diameter to the tube, A B. In these vesels the water is supported partly by the attraction of cohesion, and partly by the pressure of the atmosphere. That the pressure of the atmosphere contributes in a great degree to this effect is evident, because the water will not rife spontaneoufly into the vesels, O N, P S, to the heights K and P, and also because if these vesels full of water as high as P, K, together with the bafoon, be placed under the receiver of an air-pump, on exhausting the receiver of air or removing the pressure of the atmosphere, the water will descend in them, and will remain in them only as high as it would ascend spontaneoufly. Mr. Cavallo (ubi infra) has illustrated the mode by which water is supported in these vesels; and for this purpose he has calculated, that if the diameter of the aperture, P, be 0.004 of an inch, which will be nearly the case when the perpendicular altitude, P Q, of the water is 1 foot, the whole preffure of the atmosphere on the surface of the water in the tube at P, will be little more than one grain; and as the atmosphere preffures upon that surface with only the 32d part of its entire force, the perpendicular height of the water in the vesel, P Q S, being one foot, the actual preffure of the atmosphere on the surface of the water at P S will be 87/4 of a grain nearly. But this trilling preffure not being sufficient to overcome the attraction between the water and the surface of the tube, P, the water must remain suspended in the vesels, P Q S, or O N. The following experiment corroborates this explanation. Fill the vesels, O N, or P Q S, up to the height, T, by lowering them in the water of the bafoon; and in that situation touch the aperture, O, or P, with a wet finger, so as to introduce a little water into it. Then if the vesel be drawn up, leaving its lower aperture only in the water of the bafoon, the column of water, T N, or T Q, will remain suspended in it, though there be no communication whatever between the water at T, and the water in the capillary aperture.

The altitudes of water, suspended in compound tubes, vary inversely as the diameters of the upper orifices nearly. E.G. In open cylindrical tubes, whose diameters are equal to those of the different parts, A B, and C, (fig. 9.) of the compound tube, A B C, water rifies spontaneously to altitudes equal to g r, and g s, which are inversely as their diameters nearly. Whether the orifice, A or C, be immersed in the fluid, it rifies to the altitude, g r; but if the tube be filled, so that the water may be in contact with the narrow part of the tube, C, the whole column will be suspended, if its altitude does not exceed g t. Again, let a f, and b g, (fig. 10.) be the altitudes of water railed spontaneously in the open cylindrical tubes, E D, and D F, respectively, which are inversely as their diameters. When the wider orifice is immersed, and the tube is filled with water to an altitude less than the length of the wider part, it will subside to a level with the point, g: but if the water be admitted into the narrower tube, the whole column will be suspended if its length does not exceed a f. If the tube be inverted, and the narrower orifice immersed, and water railed into the tube, D F, it immediately sinks, if the altitude of the column exceed b g. Let a d e, (fig. 11.) be a capillary siphon, in whose narrower and wider legs, if sufficiently long, columns of water, whose altitudes are e f, and g b, respectively, and which are inversely as their diameters, may be suspended.
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Fill this fion with water, and hold it in the position of fig. 11; and the fluid will not run out of the orifice, if the liquid be not of such a nature as to form a small angle with the edges of the plate, or the fluid be not of such a nature as to be easily attracted by the edges of the plate. The fluid will flow out of the orifice, if the liquid be not of such a nature as to form a small angle with the edges of the plate, or the fluid be not of such a nature as to be easily attracted by the edges of the plate.

Capillary tubes which naturally discharge water only in separate drops, yield, when electrified, a continued and accelerated stream; and the acceleration is proportional to the smallness of the tube; and the effect of electricity is so considerable as to produce a continued stream from a very small tube, out of which the water had before been able to drop. Priestley's Phil. Electr. 8vo, vol. 1, p. 171.

In connection with the preceding account of capillary tubes we shall here introduce that of contiguous glass plates, between which water rises according to the same law with that of fuch tubes, or in such a manner that the altitudes are inversely as the distances of the plates. E. G. If the glass plates be parallel to each other and placed with their lower edges in water, the water will rise between them, and will remain suspended at a certain height. This height is not so great as that of the water in a glass tube, whose diameter is equal to the distance between the two plates, for an obvious reason; because the water in the tube is surrounded on every side by glass; nevertheless the proportion is the same; i. e. in two or more pairs of glass plates, the altitudes of the water are inversely as the distances of the plates, and the cause of the ascent is the same as in glass tubes. A C D F and B C D E, (fig. 13.) represent two flat glass plates, placed so as to form a small angle, A C B, and immersed with their lower edges in water. The water will rise between them, and remain suspended in the space E F C D E, the outer edge of which, E F C, being a curve called an "hyperbola." One extremity of this curve rises as high as the upper part of the glass plates at C, and the other extremity reaches as far as the edges of the glasses contiguous to the water of the basin at F and E. The water between these plates rises higher near the side, C D; and lower at a distance from it. In short, at any distance from C D, as at a b, c d, e f, the water rises as high as it would rise between parallel plates, whose distance from each other equals the distance between the plates of fig. 15, at any of those particular places. Consequently the altitudes of the water at different distances from C D, are inversely as the distances between the two plates at those places. In fig. 14, which exhibits the same elevation of water with that which is represented in fig. 13, any two, or more, altitudes of water, as a b and c d, are inversely as the distances a b, c d, between the two plates at those places; viz. a b : c d :: d e : b i, (by the similarity of the triangles D b t, D d i) D b : D d i, and this is the known property of the common hyperbola, whose asymptotes are the edge, C D, of the glasses, and the line, D S, where the glass plate intersects the surface of the water in the vessel, G. The water must evidently rise as high as the apex, C, whatever be the altitude of the plates, since the glasses plates come infinitely near each other near the edge, C D. If these plates were bent more or less, then the edge of the water which rises between them would not be an hyperbola, but very according to the curvature of the plates. Let two flat glass plates be disposed, as in fig. 15, so as to form a small angle with each other, as in the former case; and the water will rise between them to a small angle with the horizon, having the edge, B, a little elevated. Let them be separated at C E by the interposition of some thin body, and previously moistened with water; and if a drop of water be introduced between these plates at E C, so as to touch them both, it will move spontaneously towards the upper part of the plates, as far as the edge, A B. The drop of water moves towards the edge, A B, even against the direction of its gravity; because the attraction of the glasses towards the drop is stronger where the plates are closer to each other, as at A, than where they are further apart, as at E; so that the drop at A, is more powerfully attracted towards A, than towards E. If the drop, A B, be gradually raised higher and higher above the horizon, whilst the drop is moving, it will be perceived to move forward and downward towards A B, until at last the gravity of the drop balances the attraction of the glasses, and the water remains at rest. After which, if the edge, A B, be raised still higher, the weight of the drop being greater than the attraction of the glasses, will cause it to descend towards C E.

Phenomena of attraction, similar to those already illustrated in the case of glasses and water, take place between almost every fluid and every solid; even between fluids and solids, or solids and solids. However, a considerable difference results from the different degrees of force with which the particles of each body attract either another, or those of another body. The attraction of water to glafs is greater than the mutual attraction of its own particles; it is also greater than that of any other fluid towards glafs, not excepting even spirituous liquors, which are specifically lighter than water; and hence it is, that water rises higher in capillary tubes than any other liquor. Müschenbrock, Martin, and other writers have given tables of the heights to which different fluids ascend in capillary tubes. It is owing to this capillary attraction, that water rises through the fine veils of wood, and ascends to the tops of the highest trees; that it infuses itself through the pores of certain stones, through sand, sugsar, silt, &c. and that in damp weather, when the air deposits a considerable quantity of water, wood, glue, ropes, linen, paper, parchment, salts, &c. imbibe the water, and are thereby swelled, moistened, softened, and some of them actually dissolved. Hence it is that metals in a fluid state rise and spread themselves between the contiguous surfaces of other metals that are in a solid state; and this is the foundation of the art of fodingerling metals. Hence also mercury infuses itself through the pores of gold and tin; for the particles of mercury attract one another much less than they do those of gold or tin. See Ascent of Fluids. See also Adhesion and Cohesion.

If glafs be applied to any other fluid, whose particles attract each other more strongly than glafs attracts them, all the phenomena of such a fluid in Capillary tubes, and between glafs plates, will be the reverse of those pertaining to water. Quicksilver is such a fluid; and, therefore, if a small globule of quicksilver be laid upon clean paper, and a piece of glafs be brought into contact with it, the mercury will adhere to it, and will be drawn away from the paper; but if, whilst the small globule of quicksilver is thus adhering to the glafs, a large quantity of the same fluid be brought in contact with the small globule, the latter will immediately difengage itself from the glafs, and incorporate with the other matter. We here perceive that a greater degree of attraction subsists between the particles of mercury than between them and glafs, so that it is impossible to spread quicksilver, like water, over the surface of glafs. If quicksilver be put in a glafs, and any wooden or earthen vessel, more than an inch in width, the surface of the quicksilver will be horizontal towards the middle, but convex towards the side. If an iron ball be laid upon the quicksilver, a depression of the quicksilver will be observed all round the ball; if two such balls be placed upon quicksilver, not very far asunder, they will run towards each other; be-
C A P

nate, where the cavities or depressions of the quicksilver are joined either between the ball and the side of the vessel, or between the two balls, there the prejudice of the quicksilver upon the ball, or balls, is diminished by the attraction of the quicksilver below; and of course the balls are impelled that way by the superior prejudice on the opposite sides. If a small tube, (fig. 15) open at both ends, be partly immersed in mercury, the mercury will be found to stand lower within the tube than in the vessel; and this prejudice has been found to be inverts as the diameter of the tubes. Thus, if two tubes are immersed in quicksilver, and the diameter of one is double that of the other, then the difference of perpendicular altitudes between the surface of the quicksilver in the latter tube and in the bason, will be double to the like difference with the former tube. As quicksilver is an opaque body, it will be necessary to hold the tube A B near the side of the vessel, which is supposed to be of glass, in order to render the depression of the quicksilver within the tube perceptible. The same thing takes place between parallel glass plates. If they be immersed in quicksilver, this fluid will stand lower between them than in the other part of the vessel; and the depression is likewise as the distances between the plates. If the plates be situated so as to form a small angle, the quicksilver, rising near the angular edge than at a distance from it, will form a curve, which is an hyperbola, whose asymptotes are the perpendicular edge, or line of the junction of the glasse, and the level of the mercury in the bason. If a glass plate be laid in an horizontal situation, with a pretty large drop of quicksilver near one edge of it, as in fig. 17, which represents a section of it, and another glass plate, A B, be laid so as to form a small angle with it, and at the same time to comprize the drop of quicksilver, the latter will move spontaneously towards O, i.e. towards the aperture of the angle, in order to recover its globular figure. If a tube open at both ends, be having its lower end drawn out into a fine capillary aperture, be filled with quicksilver to the altitude of about an inch or two, no mercury will escape from the lower aperture; but if this lower extremity be suffered to touch other mercury, or if, by breaking off part of the small end, the aperture be enlarged, the quicksilver will readily run out. For other particulars relating to this subject; see the articles to which we have already referred. Mufchenbrock, Introdt. at Phil. Nat. tom. i. c. 20. Gravelfand. l. i. e 5. Helphen, Leift. i. ii. Cotes's Hydroil. &c. Lectures, leift xi. Newt. Opt. p. 382. Hamilton's Left. ii. Defaguliars Course of Exp. at Phil. vol. i. p. 10. p. 37. &c. Martin's Phil. Brit. vol. i. p. 24, &c. Parkinson's Syll. of Mechanics and Hydrostatics, ch. v. Cavallo's EKm. of Nat. or Exp. Phil. vol. ii. ch. 5.

Capillary vesicles, in Anatomy, the most minute and subtle ramifications of the vesicles of animal bodies. Many small vesicles of animal bodies have been discovered by the modern invention of injecting the vesicles of animals with a coloured fluid, which upon cooling grows hard. See Injuncton. Capillary worms, in children, are the same with what are otherwise called crinones, comedones, and dracunculi.

Capillation, or Capillary fractures, according to some writers, is a fracture in the skull, so small that it can scarcely be perceived; but yet it often proves mortal. See Fracture.

Capillitium Veneris, in Physiology, denotes a meteor appearing in the air, in form of fine threads resembling a spider's web. Some think that the capillitium Veneris derives its origin from a cloud, the watery parts of which have been exhaled by the sun's heat, only the earthy and sulphurous parts are left behind, which shoot into this figure. It is sometimes also found hanging about woods and coppices, or even extended on the ground like a fine net, frequently enough mistaken for spiders' webs.

Capillus, See Hair.

Capillus Veneris, in Botany, See Adiantum Capillus Veneris.

Capilupi, Lelio, Camillo, Ippolito, and Julio, in Biography, natives of Mantua and distinquished as modern Latin poets. Lelio, who is said to have died in his native place in 1560, at the age of 62 years, excelled in the composition of cantos, and applied some of the verses of Virgil to a description of the modes of life in monasteries, and of the vernacular clesse. Camillo wrote a book entitled "The Stratagem," in which he gives an account of the massacre at Paris on St. Bartholomew's day: he was not only distinquished as a poet, but employed in several embassies. He died in 1548. Ippolito, the third brother, was born in 1511, occupied several poetical dignities, and whhil he was first secretary and minister at Rome of cardinal Hercules and D. Ferrante Gozzana, wrote letters to both, several of which are extant. The most interesting are those that relate to the war of Parma and Mirandola carried on by pope Julius III., and they display much skill in negotiation and great zeal in the service of his master. In 1560 he was promoted to the bishopric of Fano by Pius IV. and in the following year deputed as his nuncio to Venice. He died at Rome in 1598. Julio, the nephew of the former, is said to have surpassed his uncle Lelio in the composition of cantos. Some have said that Ippolito excelled in fictirical poetry; but others affirm that he, as well as Julio and Camillo, excelled in the elegiac. The "Virgilian canto of the lives of Monks" was printed at Basili in 1525; and Meibomius published "Julii et Lelii Capiluporum patrum Centos Virgiliani, &c." at Helmfpadt, in 4to. 1600. The "Carmina corundem," appeared at Rome, 4to. 1577. The poems of the other brothers are printed in the first volume of the Delicte Poesarum Italorum. Gen. Dict. Tiraabolchi.

Capinero, in Ornithology, one of the synonyms of Motacilla Atricapilla, being the name affinged it by Olina.

Capiplenium, from caput, head, and plerus, full, is used by some authors for a catarh; but more properly, by the Italian physicians, for a continual heaves of the head, frequent at Rome, and almost endemic.

Capiro, in Geography, a mountain of South America, being one of those that surround the harbour of Porto Bello, flanks at the utmost extremity of the harbour in the road to Panama. Its top is always covered with clouds of a density and darknesse seldom seen in those of this atmosphere; and from these, which are called the "Capillo," or cap, has poibably been corruptly formed the name of Monte Capiro. When these clouds thicken, increase in blacknes, and flink below their usual station, it is a sure sign of a tempest. Whereas on the other hand, their clearnes and ascent as certainly indicate the approach of fair weather. These changes are very frequent and very sudden; and the summit of the mountain is seldom observed free from clouds. Hence Capiro is regarded as the barometer of the country, by foctelling every change of weather.

Capisculos, or Capiscolum, in Ecclesiastical Writers, denotes a dignitary in certain cathedrals, who had the superintendence of the choir, or band of music, answer- ing to what in other churches is called chanter or preacher. The word is also written capisculus, and capuscullus, q. d. the head of the school or band of music. The capisculus is also called soiulisus, as having the instruction of the young clerks and choristers, how to perform their duty.

Capiass,
CAPITAM, or the Latin caput, is used on various occasions to express the relation of a head, chief, or principal: thus...

CAPITAM, in Geography, a small place, with a principality, of Naples, in the province of Abbruzzo Ultra.

CAPISTRATUS, in Ichthyology, a species of Caroton, with entire tail; twelve spines in the dorsal fin; body frizzled; and an occelated spot near the tail.

This fish has the head rather large, with eyes of considerable size; a black oval band with white margin; fins yellowish, with branched rays; dorsal and anal fin bordered with brown; and a black band near the caudal fin.

CAPISTRUM, Lat. a bandage used by performers on trumpets and other wind instruments among the ancients, to keep the cheeks and lips firm, and to prevent the distorsion of the countenance. It was called σφέκτα, or τρίφατον, by the Greeks, and is supposed to have been invented by Merytas. It is mentioned in Putharch's Syntagma, in the Scholia of Aristotle, and elsewhere, and may be seen in some ancient sculpture which Bartholomus has had engraved in his treatise De Tribus Veterum... 

CAPISTRUM, in Surgery, a head-flail, or bandage used in case of injuries of the head, especially fractures of the jaw.

CAPITA, or CAPITUM, in Antiquity, denotes a tax among the Romans for the maintenance of the horses in the army, levied according to the number of heads thereof.

CAPITA, distribution by, in the Civil Law, is such a distribution, that every man has an equal share of personal estate, when all the claimants claim in their own rights, as in equal degree of kindred, and not jure representationis, in the right of another person. This mode of distribution is contradistinguished from a distribution per stirpes, which is the only rule of succession according to the common law. Thus, if the next of kin be the intestate's three brothers, A, B, and C; here his effects are divided into three equal portions, and distributed per capita, one to each; but if one of these brothers, A, had been dead, leaving three children, and another...
But if a capital be employed in the improvement of land, in the purchase of useful machines and instruments of trade, or in similar things which yield a profit without changing matters, or circulating any farther; this kind of capital may be called a fixed capital. Every fixed capital is originally derived from, and requires to be continually supported by a circulating capital: nor can the former yield any revenue but by means of the latter. The circulating capital also in its turn requires fresh supplies, without which it would soon cease to exist; and these supplies are principally drawn from three sources, viz. the produce of land, that of mines, and that of fisheries. The cultivation of which requires both a fixed and a circulating capital, and yields a profit, when their natural fertility is equal, proportional to the extent and proper application of the capitals employed about them; or, if the capitals are equal, and equally well applied, proportional to their natural fertility. The intention of the fixed capital is to increase the productive powers of labour, or to enable the same number of labourers to perform a much greater quantity of work. In a great country, the expense of maintaining a fixed capital may be compared to that of repairs in a private estate; and is the necessarily excluded from the next revenue of the society. But the cafe is different with respect to that which maintains the circulating capital. Of the four parts of which this latter capital is composed, viz. money, provisions, materials, and finished work, the last are regularly withdrawn from it, and placed either in the fixed capital of the society, or in their stock referred for immediate consumption. Whatever portion of these consumable goods is not employed in maintaining the former, goes altogether to the latter, and forms a part of the next revenue of the society. In this respect the circulating capital of a society is different from that of an individual; the latter is totally excluded from making any part of his next revenue, which must consist wholly in his profits. But though the circulating capital of every individual makes a part of that of the society to which he belongs, it is not on that account totally excluded from making a part likewise of their next revenue. Although the whole goods in a merchant's warehouse or shop may be so means be placed in his own stock, referred for immediate consumption, they may be so placed in that of other people, who, from a revenue derived from other funds, may regularly replace their value to him, together with its profits, without occasions any diminution either of his capital or of theirs. Money, therefore, is the only part of the circulating capital of a society, of which the maintenance can occasion any diminution in their next revenue. The fixed capital, and that part of the circulating capital which consists in money, so far as they affect the revenue of the society, bear a very great resemblance to one another. See Money. When we compare the quantity of industry which the circulating capital of any society can employ, we must always have regard to those parts of it only, which consist in provisions, materials, and finished work; the other, which consists in money, and which serves only to circulate those three, must always be deducted. Money may be requisite for purchasing the materials and tools of the work, as well as the maintenance of the workmen. But the quantity of industry which the whole capital can employ, is certainly not equal both to the money which purchases, and to the materials, tools, and maintenance, which are purchased with it; but only to one or other of these two values, and to the latter more properly than to the former. Smith's Wealth of Nations, vol. i.

For the extension of capitals by the aid of banks and paper-credit; see Bank and Paper-Money.

CAPITAL, in Money Matters, denotes the sum of money put out to interest. In which sense it amounts to the same with principal, and stands opposed to interest. The borrower may use it either as a capital, yielding a certain annual rent to the lender, or as a stock referred for immediate consumption. If he uses it as a capital, he employs it in the maintenance of productive labourers, who reproduce the value with a profit; in which case he will be able both to restore the capital and pay the interest without alienating or encroaching upon any other source of revenue. But if he uses it as a stock referred for immediate consumption, he acts the part of a prodigal, and dissipates in the maintenance of the idle, what was defined for the support of the industrious; and in this case, he can never restore the capital nor pay the interest, without either alienating or encroaching upon some other source of revenue, such as the property or the rent of land. What the borrower in either of these ways really wants, and what the lender readily supplies him with, is not the money, but the money's worth, or the goods which it can purchase. If he wants it as a stock for immediate consumption, it is those goods only which he can place in that stock. If he wants it as a capital for employing industry, it is from those goods only that the industrious can be furnished with the tools, materials, and maintenance, necessary for carrying on their work. By means of the loan, the lender, as it were, assigns to the borrower his right to a certain portion of the annual produce of the land and labour of the country, to be employed as the borrower pleases. It is the value of that part of the annual produce, which, as soon as it comes from the ground, or from the hands of the productive labourers, is defined not only for replacing a capital, but such a capital as the owner does not care to be at the trouble of employing himself, that regulates the quantity of stock, or of money, which can be lent at interest in any country. As such capitals are commonly lent out and paid back in money, they constitute what is called the monied interest; which fee.

These capitals may be greater in almost any proportion than the amount of the money which serves as the instrument of their conveyance; the same pieces of money successively serving for many different loans, as well as for many different purchases. Hence, a capital lent at interest may, in this manner, be considered as an assignment from the lender to the borrower of a certain considerable portion of the annual produce; upon condition that the borrower in return shall, during the continuance of the loan, annually affsign to the lender a smaller portion, called the interest; and at the end of it, a portion equally considerable with that which had been originally assigned to him, called the repayment. In proportion as the share of the annual produce which, as soon as it comes either from the ground, or from the hands of the productive labourers, is defined for replacing a capital, increases in any country, what is called the "Monied Interest" naturally increases with it. The increase of those particular capitals from which the owners with to derive a revenue, without being at the trouble of employing them themselves, naturally accompanies the general increase of capitals; or, in other words, as stock increases, the quantity of stock to be lent at interest grows gradually greater and greater. As capitals increase in any country, the profits which can be made by employing them necessarily diminish; and it becomes gradually more and more difficult to find within the country a profitable method of employing any new capital. In consequence of this there arises a competition between different capitals; the owner of one endeavouring to get possession of that employment which is occupied by another. The demand for productive labour, by the increase of the funds which are defined for maintaining it, grows every day
day greater and greater; so that labourers easily find employment, while the owners of capitals find it difficult to get labourers to employ. This competition raises the wages of labour, and sinks the profit of stock. But when the profits which can be made by the use of a capital are thus diminished, as it were, at both ends, the price which can be paid for the use of it, that is, the rate of interest, must necessarily be diminished with them. See Interest.

All capitals are defined for the maintenance of productive labour only; and yet the quantity of such labour, produced by equal capitals, varies very much according to the diversity of their employment; which is also the case with respect to the value added by that employment to the annual produce of the land and labour of the country.

A capital may be employed in four different ways; either, first, in procuring the rude produce annually required for the use and consumption of the society; or, secondly, in manufacturing and that rude produce for immediate use and consumption; or, thirdly, in transporting either the rude or manufactured produce from the places where they abound to those where they are wanted; or, lastly, in dividing particular portions of either into such small parcels as suit the occasional demands of those who want them. In the fifth of these ways are employed the capitals of all those who undertake the improvement or cultivation of lands, mines, or fisheries: in the second, those of all smaller manufacturers; in the third, those of all wholesale merchants; and in the fourth, those of all retailers. Each of these methods of employing a capital is essentially necessary either to the existence or extension of the other three, or to the general conveniency of the society. The persons whose capitals are employed in any of these four ways are themselves productive labourers. Equal capitals, however, thus employed, put into motion very different quantities of productive labour, and augment also in very different proportions the value of the annual produce of the land and labour of the society to which they belong. But no equal capital puts into motion a greater quantity of productive labour than that of the farmer; and, of course, the capital employed in agriculture adds a much greater value to the annual produce of the land and labour of the country, and to the real wealth and revenue of its inhabitants. Consequentially, of all the ways in which a capital can be employed, this is by far the most advantageous to the society. The capitals employed in the agriculture and in the retail trade of any community must always reside within that community. Whereas the capital of a wholesale merchant seems to have no fixed or necessary residence anywhere, but may wander about from place to place according as it can either buy cheap or sell dear. The capital of the manufacturer must reside where the manufacture is carried on; but where this shall be is not always necessarily determined. It may frequently be at a great distance from the place where the materials grow; and from that where the complete manufacture is continued. Thus, part of the wool of Spain is manufactured in Great Britain, and some part of that cloth is afterwards sent back to Spain. The same observation applies to the cotton manufacture. Whether the merchant whose capital exports the surplus produce of any society be a native or a foreigner, is of very little importance; but it is of great consequence, that the capital of the manufacturer should reside within the country. It may, however, be very useful to the country, though it should not reside within it. The capitals of the British manufacturers, who work up the hemp and flax annually imported from the coasts of the Baltic, are without doubt very useful to the countries which produce them. The merchants who export the commodities wanted in these countries, in exchange for these materials, replace the capitals of the people who produce them, and thus encourage them to continue the productions, and the British manufacturers replace the capitals of those manufacturers.

When the capital of any country is not sufficient for all the three purposes now noticed, in proportion as a greater share of it is employed in agriculture, the greater will be the quantity of productive labour which it puts into motion within the country, and also the value which its employment adds to the annual produce of the land and labour of the society. After agriculture, the capital employed in manufactures puts into motion the greatest quantity of productive labour, and adds the greatest value to the annual produce. That which is employed in the trade of exportation has the least effect of any of the three. The country, which has no capital sufficient for all these three purposes, has not arrived at that degree of opulence for which it seems naturally designed. But an attempt to accomplish all these three, prematurely, and with an insufficient capital, is certainly not the shortest way for a society, any more than for an individual, to acquire a sufficient one. The capital of all the individuals of a nation has its limits like that of a single individual, and is capable of executing only certain purposes; and it is increased by their continually accumulating and adding to it whatever may be saved out of their revenue: and the revenue of all the inhabitants of the country is necessarily in proportion to the value of the annual produce of their land and labour. The course of human prosperity, indeed, seems scarcely ever to have continued for a long time to enable any great country to acquire capital sufficient for all these three purposes; unless, perhaps, we give credit to the wonderful accounts of the wealth and cultivation of China, of those of ancient Egypt, and of the ancient state of Hindostan. These three countries have been chiefly renowned for their superiority in agriculture and manufactures; nor do they appear to have been eminently for foreign trade. The greater part of the surplus produce of all these countries seems to have been always exported by foreigners, who give in exchange for it something else for which they found a demand there, frequently gold and silver. It is thus that the same capital will in any country put into motion a greater or smaller quantity of productive labour, and add a greater or smaller value to the annual produce of its land and labour, according to the different proportions in which it is employed in agriculture, manufactures, and wholesale trade. See Trade.

The consideration of his own profit is the sole motive which determines the owner of any capital to employ it either in agriculture, in manufactures, or in some particular branch of the wholesale or retail trade; and, therefore, in countries, where agriculture is the most profitable of all employments, the capitals of individuals will naturally be employed in the manner most advantageous to the whole society. The profits of agriculture, however, seem to have no superiority over those of other employments in any part of Europe; infomuch that it would be difficult to produce a single instance, in which a large fortune has been acquired by agriculture, in the same time and from the same capital, which have yielded such a fortune by trade and manufactures, in the whole of Europe during the present century; and therefore agriculture is capable of absorbing a much greater capital than has ever yet been employed in it. Smith's Wealth of Nations, vol. ii. Book ii.

Capital, in Architecture. This term is taken immediately from the Italian word capitello, which is derived from the Latin caput, head. Thus the etymology of this word
word defines its meaning, for the capital is properly the head of a column.

The capitals used in the architecture of the Greeks, though with numberless minute variations of ornaments and proportions, arrange themselves into three general classes, and offer the most obvious distinction between the orders. In this style also it is easy to distinguish between those parts which have their use and origin in the original type of that wooden construction from which Grecian architecture is derived and those which are merely ornaments and accessories. Considering columns in their origin as cylindrical wooden poles, the abacus, which is a square tile or tablet, has an evident use in sheltering and protecting the upper part of the column by its projection, and also in giving a broader base and more convenient form for the placing of the architrave. The abacus therefore may be regarded as the original capital which is most conspicuous in that order which bears the marks of the lightest antiquity, attenuated and altered in succeeding orders and succeeding ages, but never omitted either in the purity of Grecian architecture or its deteriorated imitations.

The Doric order, which prefers more of the primitive type than any other, has a broad and mafly abacus, which with an ovolo and some small fillets, varying in number from three to five, constitutes the whole capital. See Plate XIII. Architecture and Plate 1. fig. 5 and 6.

In the Ionic order we find a very considerable variation; here we have a small and moulded abacus, below which depend two spiral volutes; there is also an echinus and bead, see Plate XXVIII. Architecture. The side of the capital is different as the volutes appear in front, and prevent a pillow or baluster laterally.

The Corinthian is the most richly ornamented of capitals; in this the abacus is hollowed, forming a quadrilateral figure with concave sides, the angles of which are generally truncated, and in the middle of each side there is placed a flower. Below the abacus the capital has the form of a vase or bell which is surmounted with two tiers of leaves. Under each angle of the abacus rises a volute and caulicolli bend under the flowers which occupy the centres of the sides. See Plate XXIX. Architecture.

Such are the general characteristics which are common to all these capitals, but the variations are numerous. The Ionic capital in Grecian examples varies in the more or less flattened form of the ovolo, in a greater or less number of annulets, in the proportions of the parts to one another, and to the column. In the Doric order, composed by modern authors from one or two imperfect Roman authorities, the capital is very different; here we find a feble abacus divided with mouldings; an ovolo and annulets, and below this a necking with an astragal and fillet. See Plate XVI. Architecture. The necking is even sometimes ornamented with husks and rosettes.

The principal variations of the Ionic capital in ancient examples are in the size of the volutes, the form of its curve, and number of revolutions. In the capital of this order, in the temple of Minerva Polias, at Athens, a beautiful and singular instance, we observe an ornamented necking. See Plate 1. Architecture. The circumference of the Ionic capital being dissimilar in front and side, has caused considerable inconvenience in its use. For supposing a quadrangular portico to be erected of this order, the columns in front would all have the volutes outward, and the capitals at the angles would present the baluster side laterally; then either all the columns of the side ranges must have the baluster side outwards to correspond with those at the angles, which would be a singular absurdity, or uniformity must be violated. To remedy this defect, the ancients made the outer volute of the angular capital project diagonally, so as to correspond equally with a volute in front and one on the side. This distorted capital, however, was considered so great a blunder, that most modern architects, when they had occasion to use Ionic columns on plans facing two ways, have adopted the invention of Scamozzi, which consists in projecting all the volutes diagonally, thus forming a capital similar every way, while the abacus has the form of the Corinthian abacus, and like that has a flower in the centre of each side. It is this which is called the modern Ionic capital; an invention which only obviates the difficulty complained of, by spoiling all the capitals, instead of merely those at the angles, for in beauty and elegance these capitals will not bear the smallest comparison with antique examples. This practice was greatly approved at the time, and nearly superseded the ancient method even in circumstances where no accommodation was necessary.

The Corinthian capital varies in the division and form of the leaves; these are directed by Vitruvius to be of the acanthus kind, and thus we find them in the order of the temple of Vesta at Tivoli. The greater number however, both of ancient and modern capitals, are composed of olive leaves, which have three, four, or five folds in each division. The general height too varies from 57 to 77 minutes. Perhaps the most beautiful example extant of a Corinthian capital, is that of the three columns in the Campo Vaccino at Rome, supposed to be the remains of a temple of Jupiter Stator. See Plate XXIX. Architecture.

It remains to speak of the Tuscan capital. There are no well authenticated remains of this order, and the pretensions of Vitruvius on this head are too obscure that the modern compilers of systems of architecture have of course varied exceedingly in their designs, and the order that passes under this name must be regarded rather as a modern than an ancient invention. It has been made to differ from the modern Doric by an air of poverty and rudeness, by the suppression of parts and mouldings. See Plate XIV. Architecture.

The Composite appears never to have been admitted as a separate order by the ancients (see Composite order). It will, however, be necessary to describe what by modern architects has been denominated the Composite capital. This is a combination of Ionic and Corinthian forms; the upper part has the shape of a modern Ionic capital, and the lower part is surmounted with two tiers of acanthus leaves. See Plate XXVII. fig. 4. Architecture. Of this capital there are a few examples at Rome.

From the remains of Egyptian antiquity, it appears, that the architects confined to the severest simplicity in the general forms of their buildings and principles of construction, acknowledged no given rules or orders of architecture for the proportions and ornaments of inferior members. Accordingly we find an infinite variety of capitals, many of them pilling a great richness of decoration and elegance of outline. The ornaments are in general accurate imitations of the natural productions of the country, such as the lotus, the reed, or the palm. In Plate XVI. Architecture, the reader is presented with various fragments of Egyptian architecture. Here fig. 1, is an elegant capital composed of the branches and leaves of the palm and the capsules of its fruit. Fig. 2, is a bundle of tufts of palm flanks, taken in the spring when the branches and leaves are not yet unfolded, and the whole tree refumbles a single flower bud. In fig. 6, we may observe a considerable resemblance to the volutes of the Ionic capital. Fig. 8, is a capital from the temple of Tentyra, composed of the head of Isis and the attributes of this goddess.

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The temples of the ancient inhabitants of Hindostan, works of dateless antiquity, possess many capitals of extraordinary form and composition. In time of these we find represented the figures of elephants and horses, apparently crouching under the weight of the ceiling. Capitals very similar in ideas to these are also found in the ruins of Pericles, compaids of horses and camels. As Roman architecture sunk into the degraded and barbarous style, known in this country by the name of Saxon and Norman, which was finally superseded by the mode commonly called Gothic, ancient rules were forgotten or delphied. Ornaments were abandoned to the caprice of the carver, and an endless variety of capitals was produced more or less happy according to individual taste or barbarism. Variety indeed forms to have been the governing principle of decoration, and was pursued to an unmeaning excess in contempt of symmetry, propriety, and congruity.

Capital, in Chemistry, signifies the head of an alchimic. Capital, in French capitals, in Fortification, of a work, is an imaginary line dividing that work into two equal and similar parts. Every work in a fortification has its capital. The capital of a balhion, for instance, is the right line drawn from the point or salient angle of it to the middle of the garge, or from the angle of the interior or inward figure, or polygon, to the salient angle of the balhion, or flanked angle. A balhion is said to have a certain number of teffices or factions of capitals, when there are null in the distance from its salient angle to the point where the two semi-gorges meet each other.

The capital of a ravelin or demi-lune is a right line drawn from the re-entering angle of the counter-scarp to the point or to the flanked or salient angle of the ravelin. Capital, of a Lantern, the covering which terminates the lantern of a dome, either in the figure of a bell, as that of the Sorbonne; or of a cupola, or a spiral, as that of the church of Sapienza at Rome. Capital, of a Mill, the covering thereof in form of a cone, which turns vertically on the round tower, in order to expel the falls to the wind.

Capitals, or Capital letters, in Printing, denote large or initial letters, which are used in the titles of books, and on a variety of other occasions. It was formerly the custom to begin every noun with a capital; but the practice, being troublesome, and giving to the writing or printing a confused appearance, has been discontinued. Capitals, however, may very properly commence the first word of every book, chapter, letter, note, or any other piece of writing;—the first word after a period, and, if the two tentences are totally independent, after a note of interrogation or exclamation; but if a number of interrogative or exclamatory sentences are thrown into one general group, or if the confluxion of the latter tentences depends on the former, all of them, except the first, may begin with a small letter:—the appellations of the Deity;—proper names of persons, places, streets, mountains, rivers, ships:—adjectives derived from the proper names of places:—the first word of a quotation, introduced after a colon, or when it is in a direct form; but when a quotation is introduced obliquely after a comma, a capital is unnecessary;—the first word of an example:—every substantive and principal word in the titles of books:—and the first word of every line in poetry. The pronoun I, and the interjection O, are also written in capitals. Other words, before the preceding, may likewise begin with capitals, when they are remarkably emphatical, or the principal subject of the composition. Murray's English Grammar, p. 273, ed. 12.

The ancient MSS. both Greek and Latin, are written wholly in capitals.

In the early days of printing, there were also several editions of books in capital; as of Homer, the Greek Anthology, Aucoumian, &c. Johannes Latunus seems to have brought the ancient practice to give capital in capital.

CAPITALLIS, in Surgery. See Capillunt.

CAPITAN, or CAPTAUN, a forward, vain, impudent braggadocio, who holds of great exploit, whilst he is in reality but shy, timid, and dandified. It is a term sometimes made use of to denote an absolute coward or poltroon.

CAPITANA, or CAPTAINALY, the chief or principal galley of a state, not dignified with the title of a kingdom. The capitana was anciently the denomination of the chief galley of France, which the commander went on board of. But since the supersession of the office of captain general of the galleys in 1669 they have no capitana, but the first galley is called real, and the second patron.

CAPITANATA, in Geography, corrupted from Catapanata, denoting the district under the Catapan, or Greek viceroy, the ancient "Apulia Dauinia," but detached from "Apulia" by captain Baillius Bagiano, or Bagiano, one of its Greek governors, and erected by him into an independent province; one of the 12 provinces of Naples. It is bounded on the north and call by the Adriatic, on the south by the provinces of Bari, Basilicate, and Principato Ultra, and on the west by the Molise and Abruzzo Citt. The country is for the most part level, has few trees and springs; the air is hot, and the soil sandy; nevertheles the land, refreshed by dews, and adjoining the rivers, produces corn, and furnishes pittance for herds of cattle. The springs in the country of Manfredonia, near mount Cargano, the chief mountain of the province, are more plentifully supplied with fresh water. The sides of this mountain afford plantations of oranges; the bogs dug within it are used for building in various parts of the province; and from the top is collected snow, which is of great service in this hot country. Along the coast, which is defended by a number of towers, there are manufactures of salt. Its principal towns are Manfredonia, the capital, Vieglf, Lucera, San Severo, Larino, Troja, Termini, Bo-vino, Voltarara, and Ascoli. The extent of this province comprehends 1,141,622 moggio (5 moggio being equal to 4 English acres), and the number of inhabitants amounts, according to Spinburne, to 491,525.

CAPITANEATE, in a general sense, the name with capitana. Capitanates, in Prussia, are a kind of noble fiefs, or estates, which, besides their revenue, raise their owners to the rank of nobility. They are otherwise called fiefdoms.

CAPITANEI, or CATANEI, in Italy, was a denomination given to all dukes, marquises, and counts, who were called "capitani regis." The name appellation was also given to persons of inferior rank, who were invested with fees, formerly distinguished by the appellation of capitanei regis. Du Cange.

CAPITANEUS, Peter, or Capiteyn, in Biography, born of a noble family at Middleburg in Zealand, in the year 1514, received his education in the universities of Lou-vain and Paris. After taking his degree of doctor, he went to Copenhagen, was made professor in medicine, and first physician to the king, Christian III. ; which offices he appears to have held to the time of his death, which happened in the year 1557, as is seen by a chronogram engraved on his tomb:

"Occubuit fatis CapItaneUs aLta MiCaret, JanI teXta Ubi LUX horaqUe nona fort."
capitaneus, in Ancient Law Writers, denotes a tenant in capite, or chief. See CAPITE

CAPITANEUS Ecclesiae, the same with advocatus, which see Du Cange. Gloss. Lat. tom. i. p. 822.

CAPITANIA, the office or dignity of a captain, and more especially a perpetual feud. See CAPITANATE

CAPITANIA is also a denomination given to the twelve governments established by the Portuguese in Brazil.

CAPITATE, in Botany, the ninth class in Mr. Ray's second method, containing those compound flowers which are united in a roundish form, resembling a head, as the thistle, knapweed, &c. It is also the second division of the twenty-first order in Linnaeus's fragments of a natural method published in the Philosophica Botanica; the first division of the forty-ninth order at the end of the Genera Piantarum, and in the posthumous praelections; and the second division of the first order of the class Syngenesia in his artificial system.

CAPITATE, forming a head; applied particularly to a flower, and to the stigma.

CAPITATION, a tax, or imposition, raised on each person, in consideration of his labour, industry, office, rank, &c. This kind of tribute is very ancient, and answers to what the Greeks called εκ ταξιδεσμων; the Latin, capita, capitatio, and tributum, or tributum capite, or capitare. By this term, taxes on the persons are distinguished from taxes on merchandise, which were called vendigala,quia vendabantur.

Capitation obtained among the Jews. Accordingly Moses ordained (Exod. xxx. 36.), that every Israelite should pay half a shekel "for his soul," or person, as a redemption, "that there might be no plague among the people, when they were numbered." Several interpreters have supposed, that this was intended to take place as often as the people were numbered; and that the evasion of it, when David numbered his subjects, incurred the divine punishment of a pestilence. 2 Sam. xxiv. 1. But it has been more generally maintained, that Moses laid this tax on all the people, payable yearly, for the maintenance of the tabernacle, for the sacrifices, wood, oil, wine, flour, habits, and subsistence of the priests and Levites. In the time of our Saviour, this tribute was punctually paid. See DIDRACHMA.

The rabbins observe that even the priests and Jews in general, except women, children under 3 years of age, and slaves, were liable to pay the half shekel, worth about 15 Sols. The collectors demanded it in the beginning of Nisan, but had no recourse to compulsion till the Rosh Chodesh, when they either confirmed those to pay who had not paid, or took security from them.

The Israelites, on their return from Babylon, paid one-third part of a shekel to the temple; as they were probably, unable, on account of their poverty, to pay a greater sum. Nehem. x. 32. After the destruction of the temple by the Romans, the Jews were compelled to pay the half shekel to the temple of Jupiter Capitolinus, which they had before paid to the temple at Jerusalem. It was levied through all the provinces where any of them were settled, and carried by procurators to Jerusalem. Cicero observes, that Placcus would not suffer that tax, which was collected among the Jews in Italy, to be conveyed thither; and Titus, addressing the Jews, reproached them with ingratitude for employing this tax against their benefactors, and in carrying on the war with the Romans, which the emperors of Rome had, by a particular indulgence, permitted them to levy.

Calmet.

The mode of assessment under the Roman emperors seemed to unite the substance of a land-tax with the forms of a capitation. The returns which were sent of every province or district, expressed the number of tributary subjects, and the amount of the public impositions. The latter of these sums was divided by the former, and the latter, that such a province contained so many "capita," or heads of tribute, and that each head was rated at such a rate, was universally received, not only in the popular, but even in the legal computation. The value of a tributary head must have varied, according to many accidental, or at least fluctuating circumstances; but it is known, that the rapacious ministers of Constantinople had exhausted the wealth of Gaul, by exacting 25 pieces of gold for the annual tribute of every head; which capitation was reduced by the humane policy of his successor to 7 pieces. If we take 16 pieces of gold, or about 9l. sterling, for a kind of moderate proportion between these opposite extremes of extraordinary oppression and of transient indulgence, we shall have probably the common standard of the impositions of Gaul. When we reflect on this subject, it is obvious, that as long as a very unequal division of property must subsist in society, the most numerous part of the community would be deprived of their subsistence by the equal assessment of a tax, from which the sovereign would derive a very trifling revenue. But, whatever might be the theory of the Roman capitation, in the practice this unjust equality was no longer felt, as the tribute was collected on the principle of a real, not of a personal imposition. Several indigent citizens contributed to compose a single head, or share of taxation; while the wealthy provincial, in proportion to his fortune, alone represented several of those imaginary beings. Nevertheless, the difficulty of allowing an annual sum of about 91. sterling, even for the average of the capitation of Gaul, will be more evident by comparing the state of the same country, as it was governed by an absolute monarch of an invidious, wealthy, and affectious people, before the late revolution. The taxes of France, estimated at the annual amount of 18 millions sterling, may be considered as distributed among 24 millions of inhabitants. Seven millions of these, in the capacity of fathers, brothers, or husbands, might discharge the obligations of the remaining multitude of women and children; and yet the equal proportion of each tributary subject would scarcely rise above 5s. of our money, instead of a proportion almost four times as considerable, which was regularly imposed on their Gallic ancestors. The reason of this difference is to be found, not so much in the relative scarcity or plenty of gold and silver, as in the different state of society in ancient Gaul and modern France.

In a country where personal freedom is the privilege of every subject, the whole mass of taxes, whether they are levied on property or on consumption, may be fairly divided among the whole body of the nation. But the far greater part of the lands of ancient Gaul, as well as of the other provinces of the Roman world, were cultivated by flaves, or peasants, whose...
dependent condition was a left rigid servitude. In such a state the poor were maintained at the expense of their masters; and as the rolls of tribute were filled only with the names of those citizens who paid the means of an honourable, or at least of a decent subsistence, the comparative smallness of their number explains and justifies the high rate of their capitation. The population of the territory of the Acldi might probably amount to 800,000 persons; and in the time of Constantine this territory afforded no more than 25,000 heads of capitation, of whom 7600 were discharged by that prince from the intolerable weight of tribute. By a just analogy it may be inferred, that the free and tributary citizens did not surpass the number of half a million; and if their annual payments may be computed at about 40 millions of our money, it would appear, that although the share of each individual was four times as considerable, a fourth part only of the modern taxes of France was levied on the imperial province of Gaul. The exactions of Constantius may be calculated at 7 millions sterling, which were reduced to 2 millions by the humanity or the wisdom of Julian. But as this tax, or capitation, on the proprietors of land, would have furnished a rich and numerous class of free citizens to escape, the emperors, with the view of sharing that species of wealth which is derived from art or labour, and which exists in money or in merchandise, imposed a distinct and personal tribute on the trading part of their subjects. Some exceptions, very strictly confined both in time and place, were allowed to the proprietors who disposed of the produce of their own estates. Some indulgence was granted to the profession of the liberal arts; but every other branch of commercial industry was affected by the severity of the law; nor did the sovereign of the Roman empire, who tolerated the profession, defend it even to share the infamous富裕，of public profiteers. This general tax upon industry was collected every fourth year, and hence called the "Lustral Contribution."

The fatal period was announced by the tears and torments of the citizens, who were often compelled by the impending scourge to embrace the molt abhorred and unnatural methods of procuring the sum at which their property had been affe&ed. Gibbon's Hist. vol. iii. chap. 17.

Capitation taxes, says Dr. Smith, (ubi infra,) if an attempt is made to proportion them to the fortune or revenue of each contributor, become altogether arbitrary. The state of a man's fortune varies from day to day, and without an inquisition more intolerable than any tax, and renewed at least once every year, can only be guessed at. His assessment, therefore, must in most cases depend upon the good or bad humour of his aff-ilers, and must, consequently, be altogether arbitrary and uncertain. Capitation taxes, if they are proportioned not to the supposed fortune, but to the rank of each contributor, become altogether unequal; as the degrees of fortune are frequently unequal in the same degree of rank. Such taxes, therefore, if it is attempted to equalize them, become altogether arbitrary and uncertain; but if it is attempted to render them certain, and not arbitrary, they become altogether unequal. In the different poll-taxes which took place in England, during the reign of William III. the contributors were mostly affe&ed according to their rank, as dukes, marquesses, earls, viscounts, barons, esquires, gentlemen, the old and youngest sons of peers, &c. All shopkeepers and tradesmen worth more than 30l. were subjected to the same assessments, whatever might be the difference in their fortunes. Several of those who in the first poll-tax were rated according to their supposed fortune, were afterwards rated according to their rank. Sergeants, attorneys, and proctors at law, who in the first poll-tax were affe&ed at three shillings in the pound of their supposed income, were afterwards affe&ed as gentlemen. In the capitation tax levied in France, for a long time without interruption, since the beginning of the last century, the highest orders of persons were rated according to their rank by an invariable tariff; the lower orders of people, according to what was supposed to be their fortune, by an assessment that varied from year to year. The officers of the king's court, the judges and other officers in the superior courts of justice, the officers of the troops, &c. were affe&ed in the first manner; the inferior ranks of people in the provinces, were affe&ed in the second.

In England the different poll-taxes never produced the sum which had been expected from them. In France the capitation always produced such a sum. The mild government of England, when it affe&ed the different ranks of people to the poll-tax, contented itself with what that affair happened to produce; and required no compensation for the loss which the state might sustain either by those who could not pay, or by those who would not pay, and who, by the indulgent execution of the law, were not forced to pay. The more severe government of France affe&ed upon each generality a certain sum, which the intendent must find as he could. If any province complained of too high an assessment, it might, in the assessment of next year, obtain an abatement corresponding to the overcharge; but it was required to pay in the mean time. Capitation taxes, as far as they are levied upon the lower ranks of the people, are direct taxes upon the wages of labour, and are attended with all the inconveniences of such taxes. They are levied at little expense; and where they are rigorously exacted, afford a very sure revenue of the state. Hence, in countries where the care, comfort, and security of the inferior ranks of people are not objects of much attention, capitation taxes are very common. It is, however, but a small part of the public revenue, which, in a great empire, has ever been drawn from such taxes: and the greateft sum, which they have ever afforded might always have been found, says Dr. Smith, in some other way much more convenient to the people. Wealth of Nations, vol. iii. b. 5. c. 2.

CAPITATUS, in Jacobology, an obsolete name of that fish most commonly known in England by the name of Miller's thumb, Cottus gobio, and river bull-head of approved authors.

CAPITE, in Law, an ancient tenure, whereby a person held of the king immediately, in right of his crown and dignity, either by knight's service, or fiefage, which fee. This was the most honourable species of tenure; but at the same time it subjected the tenants to greater and more burdensome services than inferior tenures did.

By a statute, 12 Car. II. c. 29, all such tenures by knight's service of the king, or of any other person, knight's services in capite, with all rights, &c. are annulled; and all such tenures are turned into free and common fiefage; so that tenures hereafter to be created by the king are to be in common fiefage only, and not by capite, knight's service, &c.

CAPITE CENSI, in Antiquity, the lowest rank of Roman citizens, who in public taxes were rated the leahl of all, being such as were never worth above 25s. ales.

They were supposed to have been thus called, because they were rather counted and marshalled by their heads than their eftates. Aug. Cell. lib. vii. cap. 13.

The capite cenfs made part of the fifth class of citizens, being below the plebes, who formed the other moiety of that class.

The capite cenfs were not enrolled in the army, as being judged not able to support the expenses of war; for in those days
CAP

days the soldiers maintained themselves. It does not appear that before Caius Marius any of the Roman generals liked the capite ceni in their armies. Sallust, Jug. p. 135.

CAPITELLUM, in Conchology, a species of Voluta with an ovate, rugose, knotty shell, the pillar of which is triplicated.—Murex capitellum of Linnæus. This is about two inches and three quarters in length; colour white, sometimes festooned with fulvous, and marked with decussating ribs. This inhabits the Indian and American coasts.

CAPITO, WOLFGANG-EGBERTUS, in Biographies, an eminent Lutheran divine, was born in 1478 at Hagenuk in Allace, and having studied at Basel, became, in compliance with the desire of his father, a doctor in medicine. He afterwards graduated both in theology and law; and entering in 1520 into the service of cardinal Albert of Brandenburg, elector of Meissen, received from him letters of nobility. After having embraced the opinions of Luther, he formed an intimacy with Bucer and Oeocolampadius, and concurred with them in the establishment of protestantism. He assisted at the council of Marburg in 1529; and after having been twice married died of the plague in 1542. Among the various works which he wrote we may select the following; viz. "Institutionum Hebraicarum lib. ii.;" "Enarrationes in Habacuc et Oseam;" Vita Joannis Oeocolampadis;" "Refusio de Matrimonio, et Jure Magistratus in Religionem." Moreri.

CAPITO, TITINIUS, lived under the emperor Trajan, and is mentioned by Pliny (l. viii. ep. 12) as a writer of no mean character. He described the deaths of illustrious men, among whom were some of his contemporaries, condemned, without doubt, by Domitian.

CAPITO, AETIUS, a celebrated civilian, who adorned the age of Augustus and was distinguished by the favour of his sovereign. He was an opponent of Antilius Laboe, who was more illustrious by his contempt of that favour, and his flero, though harmless opposition to the tyrant of Rome. Their legal studies were influenced by the various colours of their tempers and principles. Laboe was attached to the form of the old republic; his rival embraced the more profitable subsistence of the rising monarchy. Capito, with the tame and submissive disposition of a courtier, seldom presumed to deviate from the sentiments or at least from the words of his predecessors; while the bold republican pursuad his independent ideas without fear of paradox or innovation. Laboe decided according to the letter of the law the same questions which his indulgent competitor resolved with a latitude of equity more suitable to the common sense and feelings of mankind. This opposition of sentiments was propagated in the writings and leonions of the two founders; and the schools of Capito and Laboe maintained their inerelative. The age of Augustus to that of Adrian. The two sects derived their appellations from Sabinius and Procrisus, their most celebrated teachers. Gibbon's Hist. vol. viii. p. 31.

CAPITO, in Ichthyology, an old synonym of the Cichlid, Cyprinus cephalus, which see.

CAPITO is also applied by some of the elder writers to the Mullet, Mugil cephalus, which see.

CAPITO, anadromous, one of the synonyms of Cyprinus Vimba.

CAPITO flavicollaris (Alvovandus) Cyprinus Dobula, Mull. and Gmelin. The true species to which the names Capito caroli, and capito rapae are applied by obsolete writers do not appear to be very clearly ascertained.

CAPITOL, in Antiquity, a famous fort or castle, on the Mons Capitolinus at Rome, wherein was a temple dedicated to Jupiter, hence also denominated Capitolinus, in which the senate annually assembled; and which till serves as the city-hall, or town-horse, for the meeting of the consuls of the Roman people.

It had its name, capitol from caput, a man's head, said to have been found fresh, and yet bleeding, upon digging the foundation of the temple, built in honour of Jupiter. Arrius adds, that the man's name was Telus; whence capitolinus. Others say, that the hill Tarpeius was called capitol, because it was the capital, or chief fortress of Rome.

The first foundations of the Capitol were laid by Tarquin the Elder, in the year of Rome 153, B.C. 671. In consequence of a vow which he had made to Jupiter, Juno, and Minerva, on occasion of his last battle with the Sabines, in which he obtained the victory, he levelled the steep top of the Tarpeian hill, marked out the plan of the temple, which he had promised to erect, and laid the foundation of that glorious structure, which afterwards became the principal place of the Roman worship. Historians have adorned the foundation of this temple with many prodigies, all pointing the future grandeur of the Roman empire. As there were several gods, who had altars on the same hill, and which were to be removed to make room for the new edifice, it was a matter of doubt in what part of the hill the foundations should be dug. The augurs referred to consult each deity one after another, and not to touch their altars before they had given their consent. All the gods agreed that their altars might be removed, except the god Terminus and the goddess Youth, who insisted upon not being displaced; and this circumstance gave the augurs occasion to conjecture, that the bounds of the city and empire should stand for ever, and that Rome should always flourish with youth and vigour. Accordingly the two ditches were enclosed within the walls of the temple. Dionysius Halicarnassensis places this event under Tarquin the Elder, and Livy under Tarquin the Proud. The successor of the former, Servius Tullius, as some have said, raised the walls; and Tarquin the Proud finished it, A.U.C. 221, B. C. 533, having referred for this purpose the tenth of the spoils of Scipia Pomatia, one of the most wealthy cities of the Volsci, and having procured a great number of workmen from Etruria, to begin the undertaking, who were allied in the most laborious part, by his own subjects. But his expulsion from Rome prevented his accomplishing all his purposes. Thus the edifice was not completed and consecrated till the third year after the expulsion of the kings, and establishment of the consuls. The ceremony of the dedication of the temple was performed by the consul Florus, A.U.C. 245; B. C. 528.

The Capitol occupied eight acres of ground; it was 200 feet broad, and about 215 long. It consisted of three parts; a nave, sacred to Jupiter; and two wings, or aisles, to Juno and Minerva. It was adorned from the forum by flairs; Lepidus reckons one hundred in number, because there were to many in the ascent of the Tarpeian rock. The front which looked to the south, facing the hill Palatinius, and the Forum Romanum, and the sides were encompassed with galleries, wherein those, who had the honour of a triumph, entertained the senate at a magnificent banquet, after the performance of sacrifices to the gods. Both inside and outside were enriched with numerous ornaments: the statue of Jupiter, with his golden thunderbolt, his sceptre, and crown, were the most distinguished. The gilding of the whole arch of the temple of Jupiter Capitolinus was undertaken by the Romans, according to Pliny (lib. xxxiii.) after the destruction of Carthage, and if Plutarch (in Oc-
may be credited, it call 12,000 talents. The gates of the temple were of brass, covered with large plates of gold. The inside of the temple and the columns which supported it, were all of marble.

In the same Capitol there were, likewise, a temple to Jupiter the Guardian, and another to Juno; with the mant: and on the descent of the hill was the temple of Concord.

The Capitol was burnt in the time of Sulla (A. u. C. 675. B. C. 84,) by the negligence of those who kept it. He undertook to rebuild it, but did not live to see it finished, which he intended in his last illness "as the only thing wanting (fays Tacitus, Hist. iii. 72) to complete his felicity." By his death that charge fell to Q. Lucinius Catulus, as being consul at the time, B. C. 70, who dedicated it with great pomp and solemnity, and had the honour to have his name inscribed on the front. It was burnt again in the reign of Titus, A. D. 83, and rebuilt by Domitian with a magnificent: The building which he undertook to rebuild it, but did not live to see it finished, which he intended in his last illness "as the only thing wanting (fays Tacitus, Hist. iii. 72) to complete his felicity." By his death that charge fell to Q. Lucinius Catulus, as being consul at the time, B. C. 70, who dedicated it with great pomp and solemnity, and had the honour to have his name inscribed on the front. It was burnt again in the reign of Titus, A. D. 83, and rebuilt by Domitian with a magnificent palace. The roof of it is flat, and adorned with many statues of illustrious persons among the Romans. In the new building refides the senate of Rome, who daily administer justice there; and in the wings are the apartments of the conscriptors of the city. There is also room enough for keeping antiquities and other curiosities which the traveller of taste has always admired. The "Camera apostolica," or apostolic chamber, has now usurped the rights of the famous "Senatus Populusque Romanus." In the front of this building is a high tower, with the statue of religion erected on the top of it. The double flight of steps at the entrance of this palace is the work of Michael Angelo, who likewise adorned the front with a superb fountain, and two statues representing the Nile and the Danube in a reclining posture. In the centre is a porphyry statue of Rome, in the habit of Minerva, and the usual symbols of the helmet and spear, but fitting. This is a piece of great antiquity, and much admired by connoisseurs. The large hall, where the court of justice is held by the senators, was formerly adorned with several pictures, representing the achievements of the kings of the Romans; but none of them now remain; Clement X1. having, in 1712, supplied their places with a great number of designs, exhibiting the life of pope Pius V. and his caonization. Under the "Corps de Logis" is the capital prifon. In the apartments of the conservators, in the left wing, are two celebrated statues of Julius Caesar and Augustus, both antiques and of white marble. The former, as sovereign of the world, holds a globe in his hand; the latter, a roll or book of a ship, alluding to his victories over Mark Antony and Cleopatra. Near these statues are to be seen two feet and a hand of oriental marble, being part of a colossus or statue of Apollo, which was 30 ells in height, and sent by Marcus Lucullus from Apollonia to Rome, where it was placed on the Capitoline mount. Opposite to this statue of the Capitol are also another large head and hand of brais, supposed to have been longed to a colossus of Commodus or Domitian. Near the inscription on Agrippina's monument is an admirable an cient groups, representing a lion tearing to pieces a bull; but the head is much damaged by time. Thiscolossus piece was found on the banks of the Tibor, near the O'ara gate, in the time of Paul III. Here is also a remarkable piece of architecture, in which five pieces of sculpture are joined, which had originally no connection, and were dug up in different places. In the centre, and elevated above the rest, sits Rome triumphant, in white marble, with a poniard in her left, and a bunch of palms in her right hand; and on the front of the statue, on which she sits, is a woman in tears, representing Decius, or some other conquered province. On each side of this statue is the column of a barbarian prince in a kind of black marble, called 'hedera.' Their rank may be known by their diamonds. The workmanship is exquisite; but it is not known who they are.

Here is also the marble sarcophagus of the emperor Alexander Severus and his mother Julia Mamaea, found on Monte del Grano, near Leptis, and brought hither. It is six feet long, and six broad. Not far from this is a marble column with a statue of Constantine the great, which shews that the art of sculpture was upon the decline, though these two are good pieces, as is also a pedestal of Baccus. Near it are still a very remarkable antique, viz. the "columna rostrata," which is of Parian marble; erected in the year of Rome 494, in honour of the confidatus Caius Duilius, on account of a naval victory, which he obtained over the Carthaginians. Near it is a baso-relievo, representing Curtius leaping into the abyss. At the first landing place are seen two antique fountains; and a little farther, four admirable baso-relievi, representing the triumph of Marcus Aurelius and Lucius Verus, which belonged to their triumphal arch in the Circus. Before the entrance of the great hall is a large statue, 65 feet long, cut in white marble; the head of every fifth of this species, exceeding that measure, being due to the conservators of the city. On the left hand are the Fafni confulares, down to the time of the emperor Pertinax, engraved on marble; and above these is a baso-relievo of the wolf suckling Romulus and Remus. Further in are the names of the modern conservators. In the first hall are some passages of the Roman history, painted by Gioseppi d'Arpino; as, the rape of the Sabines, the combat between the Horatii and Curatii, Romulus and Remus sucking the wolf, and the building of the city of Rome, &c. &c. But the most admired of all is the victory of Tullus Hostilius over the Veii and the Fidenates. There are various other marble statues and paintings in the different apartments, which it would exceed our limits to mention, but which must be highly gratifying to the curious.

From several remains of ancient walls, it is conjectured by some, that the temple of Jupiter Capitolinus stood on the ground which is at present inclosed in the court of the Caffarelli palace. The famous Tarpeian rock is now almost covered with buildings; but it is evident that anciently the rock must have been much steeper, or a wall must have been erected upon it, from which malefactors were thrown down headlong. That the height or depth of it has not undergone any considerable alteration may be concluded from Severus's triumphal arch at the foot of the Capitoline-hill, which, with the amphitheatre in its neighbourhood, is not above two or three feet below the present surface of the ground. See Keyser's Travels, vol. ii.

Anciently, the name capital was likewise applied to all the principal temples, in most of the colonies throughout the Roman empire: as, at Conflantinople, Jerusalem, Carthage, Ravenna, Carpea, &c.

CAPITOLIA, or ELEA CAPITOLIA, in Ancient Geography, a name given to Jerusalem in the time of Ptolemy.
CAPITOLIA, a town of Asia in Calohipia, N. of Adria, according to Ptolemy; between Adria and Gadara, according to the table of Ptolemy; and in Antonine's route from Seriana to Scythopolis, between Neva and Gadara.

CAPITOLINE Games, Ludi Capitolini, were annual games, or contests, instituted by Camillus, in honour of Jupiter Capitolinus; and in commemoration of the Capitol's not being surplundered by the Gauls.

Plutarch tells us, that a part of the ceremony consisted in the public criers putting up the Horatians to sale by auction; they also took an old man, tying a golden bull to his neck, such as were worn by their children, and exposed him to the public derision. Feltus says, they drizzled him in a praetexta, and hung a bull at his neck; not as accounting him a child, but because this was an ornament of the kings of Hetruria.

There was also another kind of capitaline games, called agones capitoline, instituted by Domitian, A. U. C. 839, A. D. 86, and celebrated each fifth year; wherein there were rewards and crowns, or garlands of oak-leaves, bellowed on the victorious poets, and put on their heads by the emperor himself. As the manner and plan of the capitaline games were taken more from the Greeks; than from the Romans, Domitian preferred in them, dressed after the Greek fashion, and wearing a crown of gold, in which were set the images of Jupiter, Juno, and Minerva. He was attended by the priest of Juno, and the college of priests, which he himself had instituted in honour of the Flavian family; all dressed like himself, except that they wore an image of the emperor in their crowns. If the crowns were given to superior merit, the exclusion of Statius, (Capitolia non tene fuscida lyra, Silv. I. iii. v. 31.) may do honour to the games of the Capitol; however, though he could not obtain the prize at these games, he was crowned three times at those of Minerva, in honour of whom Domitian celebrated a feast every year, in his house at Alba, with great pomp and magnificence. Thrice games, which were not abolished in the 4th century, became so celebrated, that the manner of accounting time by lutes, which had obtained till then, was changed; and they began to count by capitaline games, as the Greeks did by olympiads. The feast was not for poets alone, but also for athletes, orators, historians, comedians, musicians, &c.

CAPITOLINE Marbles. See Fasti.

CAPITOLINI, in Roman Antiquity, a college of men residing in the capital and arch, to whom was committed the care of celebrating the capitaline games.

CAPITOLINUS, Julius, in Biography, a Latin historian, flourished at the close of the third, and beginning of the fourth century, and wrote the lives of the emperors Antoninus Pius, Verus, Albinus, Macrinus, the two Maximens, and the three Gordians. These are extant, but some other of his compositions are lost. His matter is chiefly copièd from Herodian, and he is deemed neither a pure nor an exact writer. Voi. Hiit. Latin.

CAPITOL, or Capit, an appellation given to the chief magistrates of Toulouse, who have the administration of justice and policy both civil and mercantile in the city.

The capitouls at Toulouse are much the fame with the echevins at Paris, and the consuls, bailiffs, burgour-masters, mayors, and aldermen, &c. in other cities. In ancient acts they are called consulis capitularum, or capitini, and their body capitulum. From this last come the words capitularis and capitulis. The appellative capitilis arose hence, that they have the charge and custody of the town-house, which was anciently called capitul.
tion of government. When they felt the weight of any grievance, they had a right to petition the sovereign for redress. One of these petitions is still extant: it is addressed to Claveraguin, A.D. 803, and expressed in such terms as could have been used only by men conscious of liberty, and of the extensive privileges which they possessed. They concluded with requiring him to grant their demand, if he wished that they should any longer continue faithful subjects to him. This great monarch made no remonstrance, but signed his willingness to comply; and feasible that he himself did not possess legislative authority, he promised to lay the matter before the next general assembly, that such things as were of common concern to all might be then considered and established by common consent. Capital. tom. i. p. 495—499. As the people by their petitions brought matters to be propounded in the general assembly, we learn from another capitular, the form in which they were approved there, and enacted as laws. The propositions were read aloud, and then the people were required to declare whether they assented to them or not. They signified their assent by exclaiming three times, "we are satisfied," and then the capitular was confirmed by the subscription of the monarch, the clergy, and the chief men of the laity. Capital. tom. i. p. 617; A.D. 822. From a capitular of Carolus Calvus, A.D. 874, it seems probable, that the sovereign could not refuse his assent to what was proposed and established by his subjects in the general assembly. Tit. ix. § 6. Capital. vol. ii. p. 47.

Some distinguish the capitulars from laws; and yet, they were only supplements to laws.—They had their name, capitulars, from their being divided into capitula, chapters or sections. In these capitulars did the whole French jurisprudence anciently consist. In course of time, the name was changed for that of ordinances.

The weaknesses of the greater part of the monarchs of the second race, and the disorder into which the nation was thrown by the depredations of the Normans, encouraged the barons to usurp an independent power formerly unknown in France. The political union of the kingdom was at an end, its ancient constitution was disdolved, and only a feudal relation subsisted between the king and his vassals. The regal jurisdiction extended no farther than the domains of the crown. Under the last kings of the second race, they were reduced almost to nothing. Under the first kings of the third race, they comprehended little more than the patrimonial estate of Hugh Capet, which he annexed to the crown. All these circumstances rendered it easy for the barons to usurp the rights of royalty within their own territories. Hence, the capitulars became no less obsolet than the ancient laws: local customs were everywhere introduced, and became the sole rule by which all civil transaotions were conducted, and all causes were tried. The wonderful ignorance which became general in France, during the 9th and 10th centuries, contributed to the introduction of customary law. Few persons, except ecclesiastics, could read; and as it was not possible for them to have recourse to written laws, either as their guide in business, or their rule in administering justice; the customary law universally prevailed.

Another circumstance that greatly contributed to the disuse of the capitulars, as well as of the Salic and Roman laws, was the great extent given at this time to judiciary combats. During this period, the general assembly of the nation seems not to have been called, nor to have once exerted its legislative authority. Local customs regulated and decided every thing. The last of the capitulars collected by M. Baluze, was written in the year 921, by Charles the Simple. One hundred and thirty years elapsed from that period to the publication of the first ordinance of the kings of the third race, contained in the great collection of M. L orois: and the first ordinances, which appear to be an act of legislation, extending to the whole kingdom, in that of Philip Augustus, A.D. 1195; and the ordinances previous to this reign, contain regulations, the authority of which did not extend beyond the king's domains. See Oeuvres. Baron Montefi quo observes, (Sp. of Laws, vol. ii. p. 272) that there were several sets of capitulars. Some had relation to political government, others to economical, and others to ecclesiastical policy, and some few to civil government. Those of the last species were added to the civil law, that is, to the personal laws of each nation; for which reason, it is said in the capitulars, that there is nothing stipulated therein contrary to the Roman law. In reality, those capitulars that regarded economical, ecclesiastical, or political government, had no relation to that law; and those concerning civil government had reference only to the laws of the barbarous people, which were explained, amended, enlarged, and retrenched. But the addition of these capitulars to the personal law, occasioned, as Montefiquito conceives, the neglect of the very body of the capitulars themselves: as in times of ignorance, the abridgment of a work often causes the loss of the work itself. Ansegile is said to have made the first collection of regulations contained in the capitulars of Charlemagne and Louis le Debonnaire; which collection is divided into four books, and has been approved by Louis le Debonnaire, and Charles the Bald. After him, Benoît collected, about the year 845, the capitulars of these two emperors, omitted by Ansegile, and annexed them to the capitulars of Caroloman and Pepin. This collection is divided into three books, which comprehend, with the four preceding, the seven books of the capitulars of the French kings: the first part of these were published by du Tillet in 1548, and the whole collection of seven books by M. M. Pithou, Father Sirmond has published some capitulars of Charles the Bald; and at length, M. Baluze printed a complete edition of the capitulars in 2 vols. fol. at Paris in 1677. This contains the capitulars of the French kings, and the collections of Ansegile and Benoît, together with some other pieces.

The bishops also in the 8th and following centuries gave the name of capitula and capitulars to the regulations which they enacted in their synodal assemblies, with regard to ecclesiastical discipline, deducing them from the canons of councils, and the works of the fathers. These regulations had the force of laws only in the diocese of the prelate who published them, unless they were approved by a council, or the metropolitan; in which case, they were observed through the whole province. Of this kind are the collections of Martin, archbishop of Braga, in the year 515; those of pope Adrian I., given to Angilram, or Enguerran, bishop of Metz, in 785; those of Thidolfa, bishop of Orleans, in 767; those of Hincema, archbishop of Rheims, in 874; those of Herard, archbishop of Tours, in 878; and those of Ifase, bishop of Langres. Doujat, Hift. du Droit canon. Baluze, Pref ad Capit. M. du Pin, Ecol. Ant. of the 8th century.

CAPITULATION, in Military Language, a particular convention, agreement, compact, or treaty between two powers. Thus, one power makes a capitulation with another to furnish him with troops on condition of subsistence, pay, and certain privileges, or for other military succours or affinities. A corps or body of troops confined to surrender themselves makes a capitulation with that which forces it to do so. A governor or commandant of a place besieged enters into a capitulation with the general of the
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befiegling army when he is under the necessity of delivering it up.

The surrender of a place by capitulation is justifiable and honourable, or otherwise, in proportion to the ability, skill, perseverance, and valor, with which it has been defended.

Many governors trembling too much to their courage and the vigour of their arms are negligent in making themselves acquainted with, and practising the means of enabling them to defend the places entrusted to their care as long and obstinately as possible; and, to the bell advantage. This knowledge, however, is of the first importance, and highly efficacious. They think they shall and discharge their duty sufficiently if they expose their own lives on all occasions, either offering themselves or fought for. The examples of several places, which, though taken through want of good conduct, have neverthless been defended with a considerable degree of valour and valor, are apt to lead them into this error. But they would have no reason to dread the blame that might attach to their surrender sooner than they ought, were they to add to their valor that knowledge of defence, which they but too often neglect to acquire.

They believe, that when their outworks are taken, and the miner is attached to the body of the place, or at the mift, if the bastion be at all opened, or a breach made in it, they may surrender and capitulate with honour after appearing sword in hand on the top of the breach at the head of a battalion, that does not fight but only faces the fire of the cannon and mufquetry of the attack, and then retires from the breach behind some trifling and weak retranchment, that appears to have been made more for the capitulation of the troops than for the defence of the place. Such prompt capitulations are sometimes occa- sioned and brought about by the reasonings and importunity of the other officers, who urged by self-interest with to preserve the little baggage and effects that belong to them, and preferring the preservation of them to their real glory, persuade the governor, who for particular reasons of his own wishes also perhaps to be per- suaded, that he may capitulate with honour; that it is much better to secure by a voluntary treaty the liberty of the inhabitants and to march out drums beating, colours flying, arms loaded, balle en bocche to reload them with, matches lighted, and with some pieces of cannon, their baggage and effects, than to await an approaching extremity and to run the risk of being ilomed or having the place carried by force. They represent to him, that one part of the soldiers are wounded, that others are sick, and that those, who are still in a condition for service, are disheartened and disheartened; that their long watchings, their severe fatigues and sufferings, well entitle them to his most fervent attention to their safety and preservation. By urging these and many such other bad reasons, they endeavour to make him form the resolution, which he has himself perhaps already taken, of capitulating, and of which he is probably well pleased in his own mind; that they have made him the overtaker or pro- posal, since, after some formalities, he concludes with them on surrendering up the place; as if a bastion, that is not perhaps bared or stripped of its revetment in more than one spot, furnished a free and easy entrance to the enemy, or as if the flate to which the place belongs had gone to the ex- pense of erecting the works and reveting the ramparts for no other purpose than that of procuring such a capitulation, as troops often make in small and bad redoubts, and some- times in the open field. Such conduct is base and di- nornourable, and such ideas are grafted on ignorance of the proper method of defending works by means of retran- chments one after another, which is not only possible but practicable; and every governor or commandant, that understands and does his duty, will put in practice.

Many and numerous, indeed, are the contrivances for ren- dering the defence of a fortified place long and ruinous to the besiegers, if the governor and other officers of it were better instructed in their duty than they commonly are, and would sacrifice their interest to their glory and the good of their country. The governor or commandant of such a place, besides doing the utmost in his power to have it at all times supplied with a sufficiency of troops, provisions, artil- lery, ammunition, medicines, and every thing else, that is necessary for the support and comfort of the garrison in order to enable him to defend it properly and stand a siege, he should before it is invested or even expected to be besieged, take care that there are no ditches, fences, buildings, or any thing else within cannon-shot of the glacs or covert way, that can serve to cover the enemy from his view, or shelter them in opening their trenches. He should have every ditch filled up, every fence and tree cut down, and even every little eminence or riling ground within that dis- tance levelled if possible. Many of the governors, however, and principal officers of such places act in time of peace as if they supposed they were never to be invested, and totally neglect their environs. They permit the inhabitants to make gardens, to furround these with ditches and fences, to plant trees, and even to erect buildings within cannon-shot of their works; and the moment an enemy appears before the fame they are often so ignorant of their duty as to attempt to cannonade him and to throw their shot at him as great a distance as they are able, as if they wished to facilitate his enterprise or to aid and affiit him in the execution of his de- sign by pointing out to him the very ground where he ought to form his encampment, and the distance at which he should open his trenches and commence the attack. The besieged, however, remaining quiet instead of pursuing such injudicious conduct, is usually attended with one or other of the two following advantageous circumstances; namely, that the besiegers fix their camp either too near to the place, or farther from it than is necessary. If it be too far off, the line of cir- cumvallation becomes too extensive, and is of course less calculated than it otherwise might be for preventing succors from getting into the place. And if, on the other hand, it be too near, the besiegers after some days when the cannon of the place begin to fire on them will be obliged to move it farther off; by which means the line of circumvallation must be commenced anew, and their time and labour will be lost, which, at the beginning of a siege, is all that the besieged can expect or desire.

As it is customary for the enemy a day or two after the opening of the trenches and sometimes on the very same day to advance in order to reconnoitre the places most con- ventient or commodious for the attack, and this reconno- trying is often performed by the general of the besieging army himself, that he may know what resolution to take re- specting it; the governor or commandant of the place should take particular care that none of his people are made priso- ners. For even the most ignorant of them might furnish useful intelligence to the enemy.

When the besieging army is weak he may send out a large body of troops to keep them at a distance by means of muf- quetry. But when it is strong, he should not leave without the place, but a small number of cavalry or infantry, with direc- tions by a feigned retreat to draw the enemy into a situa- tion that will expose them to the fire of the works if they at- tempt to approach and charge them.

The governor or commandant of a fortified place should know how to counteract and prostrate the operations of the besiegers.
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befiegers by means of counter-approaches, by forties or fallies, by mines, &c.; all which he ought to make use of and put in practice, disputing every inch of ground, as well as various contrivances for rendering breaches impracticable after they appear to be practicable to the enemy, before he seriously thinks of capitulating. Before the place, intrusted to his care, is actually attacked, he should frequently weigh and ponder in his own mind every possible or practicable method of attacking it, that he can imagine or conceive, and then endeavour to find out as many different sorts of defence for countering and prolonging them. Such mental reflection and examination would render it almost impossible for any occurrence to take place during a siege, that he had not already thought of, or that did not at least bear some resemblance to what he had thought of, and, would enable him to draw from this likeness or similitude prompt resources and expedients.

The articles of capitulation are proposed by the governor or commandant of the place besieged, who receives hostages for the safety and security of those, whom he sends to the general of the enemy. It is customary to give hostages of equal rank reciprocally.

The stipulation of the articles proposed, the alteration, modification, or refusal of some of them, is governed by a variety of considerations depending on the views and knowledge or information of the general, who conducts the siege.

When the articles are signed, the besiegers take possession of some poll, or of a front attacked, according as it is agreed on.

When the time arrives, at which the garrison is to march out, it is usual to introduce into the place by way of honour and distinction the oldest corps of the army of the besiegers, which occupies polls for guarding it; and after the besieged have left it, those corps are marched into it, that are intended to garrison it.

The examination of the artillery, ammunition, flores, and provisos, that ought to remain in the place agreeably to the capitulation, precedes the going out of the garrison which is always done in concert by the officers of artillery, flore-keepers, and commissaries, who exchange signed accounts, or statements and discharges, from which the general gives orders for providing the place with what is wanted.

The troops, that march out, receive an escort sufficient for conducting them safe to the place appointed by the capitulation; an article, which of all others is in general most religiously observed.

After the marching out of the garrison, the first object of attention is the leveling and destruction of the works that were erected or thrown up for the attack of the place, and the repairing of all those, that were injured or damaged by the same. The besieging army, indeed, ought not to quit their lines after the place capitulates till they have filled them up, and either removed their heavy artillery into the place, or sent it elsewhere with whatever is not necessary for its defence. Then they may leave them either for the repose and refreshment of the troops fatigued with the siege, or for the convenience of subsistence, or to execute the remaining part of the plan of the campaign.

When the governor or commandant of a fortified place, after having made every practicable preparation for, and exhausting all his means of defence, is reduced to the necessity of capitulating, in order to obtain as favourable conditions as he possibly can both for his garrison and for the inhabitants, he orders one or more drummers to repair to that part of the rampart, which is next to the attack, and to give notice to the besiegers, by beating the chamade, that he has some proposals to make. For the same purpose one or more white flags are set up on the rampart, and one of them remains either on it or on the breach during the negotiation. The same formality is observed, when after a violent attack a submission of arms is demanded, either for the purpose of burying the dead or for carrying off the wounded.

After the beating of the chamade, the governor or commandant sends some officers of distinction to the commandant in chief of the besiegers to deliver to him the conditions on which he proposes to surrender up the garrison, the city, or fort. As a security, however, for the officers sent from the garrison, the besiegers send an equal number generally of the same rank into the place. When the governor's proposals are not satisfactory to the general of the besieging army, he on his part prefers the conditions, on which he expects it to surrender, commonly threatening to allow the governor no terms whatsoever in case he do not accede to those preferred within a certain time, or before such or such a work shall be finished. If the besieged find the terms or conditions inflected on by the besiegers to be too hard or rigorous, the officers sent to them return to the besieging army, and those sent by them return into the garrison. The drummers are directed to beat their drums upon the rampart, that every one may have timely notice to retire before hostilities re-commence, which they do very soon afterwards. During the negotiation or submission of arms no work ought to be erected or even repaired, either by the besieged or the besiegers. It is necessary, however, to be on the watch at that time as much as at any other, and strictly to guard every point liable to be attacked, to prevent any surprises by foragiers, which are regarded as warrantable and lawful.

But if the terms or conditions of the capitulation be agreed on, the governor or commandant sends two or three of his principal officers into the camp, and the besieging general sends the same number of officers of equal rank into the place, as a security for its accomplishment. When the besieged have performed every thing agreeably to the compact or treaty, their hostages are sent back to them, as are those of the besiegers as soon as the terms, they agreed to, are complied with.

The terms or conditions of a capitulation vary with circumstances and situations; but they are generally to the following purport.

1. The garrison shall march out through the breach with their arms, baggage, horses, drums beating, matches lighted at both ends, bulles en boisse, colours flying, a certain number of pieces of cannon and mortars, with their appurtenances, spare carriages, ammunition for a certain number of charges; to be conducted in safety by the shortest road, or by a specific route, to the nearest town or place belonging to the besieged, and if the distance be so great as to require a march of several days, to be provided with provisions and lodgings during that time.

2. That one of the gates shall be delivered up to the besiegers the evening of the day on which the capitulation or convention is signed, or at a certain hour next day, and that the garrison shall march out a day or two after, according to agreement.

3. The besieged shall furnish a certain number of covered waggons, which are not to be searched, besides others for carrying the wounded and sick that are in a condition to be transported, and in general all the carriages and horses necessary for removing the garrison's baggage, and the artillery allowed by the capitulation.

4. That the sick and wounded who cannot be removed or carried off, and are obliged to be left behind in the place, shall
shall have free liberty to go away, with every thing that belongs to them, when they are in a condition to do so; and they shall in the mean time be furnished with lodgings, and with provisions, goods, or otherwise, and have every sort of medical aid or assistance that can well be afforded to them.

3. That the inhabitants shall exercise their religion according to their accustomed forms of worship, without hindrance or molestation.

4. That the inhabitants, both of the place and its dependencies, shall be maintained in all their rights, privileges, and prerogatives.

5. That the citizens who choose to leave the place shall have free liberty to go whether they please with their effects; and such of the inhabitants as have drawn a partiality to the besieged, or affihed them during the siege, shall not be molested on that account.

6. All the remaining powder and ammunition shall be delivered up to the besiegers, and the loaded mines shall be blown and pointed out to them.

7. All the prisoners made on both sides during the siege shall be released.

A garrison should have a sufficiency of provisions and ammunition to last for three days to entitle them to a convention or capitulation. But if they have not near so much of either, at the signing of the capitulation, they cannot in justice be afterwards regarded as prisoners of war, because the besieged were not at the time acquainted with the circumstances.

If the besiegers will not agree to any other stipulation than the besieged's being made prisoners of war, and the garrison is not in a condition to hold out any longer, it is generally endeavored to render the conditions as little burdensome and rigorous as possible; such, for instance, as the following:

1. That the governor or commandant, and the principal officers, shall keep their swords, pistols, baggage, &c.

2. That the subalterns shall keep their swords and baggage.

3. That the common men shall not be ridden or dispersed about from their regiments.

4. That the garrison shall be conducted by the shortest road to a certain place, and there remain prisoners of war.

5. That the principal officers shall have leave for a few days to go where they please to settle their affairs.

6. When the garrison quits the place, no attempts shall be made to debuff the soldiers, or to encourage them to desert from their regiments.

When the capitulation is settled and signed, an officer of artillery from the besiegers comes into the place, who, with an officer of artillery from the garrison, takes an inventory of all the ordnance and ammunition in it; and commissaries, in like manner, take an account of all the provisions.

The besieged may destroy magazines before, but not after they have made any provision for a capitulation.

When the day arrives on which the garrison is to leave the place, the army of the besiegers is put under arms, and ranged in two files, between which the garrison marches. The general and the principal officers head the two files, to see the garrison done before them.

The governor or commandant marches at the head, followed by the principal officers, who make the garrison march in as good order as possible. The least regiments are common in the van and in the rear, and the others, with the baggage, in the centre. When there are any horse or cavalry, they are also divided into three bodies, to march as the van, centre, and rear. Small detachments of horse and foot are made to march at the sides of the baggage, to prevent it from being rifled.

The artillery allowed by the capitulation march after the first battalion.

When the garrison arrives at the place agreed on, the governor gives up the hostages of the besiegers to the escort; and when the escort reaches the army, the hostages left by the besieged for the security of the escort, carriages, and other things allowed to them, are released.

When the garrison are made prisoners of war, they are in like manner escorted to the place agreed on.

Every thing stipulated or agreed upon in a capitulation should be held sacred and inviolable, and ought to be religiously observed. For when the king grants and signs a capitulation by his general, he acts in the same capacity as when he enters into and concludes a treaty of peace by his ambassador; in either case he acts as the procurator or agent of the community at large, as the constitutional representative of parliament and the nation, and every such act of his is equally binding on both. It is evident that parliament thought fit when it passed the act that established the church of Rome at Quebec and in Canada, and was convinced that it could not constitutionally violate the stipulations made in favour of that religion in the capitulation entered into by general Amherst and the marquis de Vaudreuil.

When the surrendering place or city has a citadel, it should be stipulated that the garrison shall have a certain time allowed them for retiring into the citadel with what they want; that the sick and wounded, who are not in a situation to be removed, shall remain in their lodgings in the place till they are cured or get well, when they are to be furnished with carriages and passports to retire to some place agreed on; that none are to be admitted into the citadel that cannot be useful in assisting to defend it; and that the besieged shall not erect any work or works whatsoever for the purpose of carrying on approaches against the same during the time prescribed.

If the operations, either of the besieged or besiegers, be carried on in conjunction with confederates or allies, stipulations ought to be made on and in their behalf; and if they be principals as well as the besieged, they should be parties to the capitulation.

If the place be a maritime town, with a harbour or harbours, and shipping in them, belonging either to the besieged or to their allies, or other nations, terms or conditions respecting those should be expressly inserted in the body of the treaty or convention.

If the besieged be in a place that is situated in a country distant from their own, to which they cannot return but by water, and have no other strong hold in that country for them to retire to, they should take care to have it stipulated in the capitulation that the besieged shall furnish them with transports, provisions, and a sufficient convey, and carry them to the nearest port or ports in their own country.

As the capitulation agreed to and signed by lord Keith, lord Hutchison, Hullem capitain pouch, and general M'nest, at Alexandria the 30th August 1801, comprises as great a diversity of the foregoing specified conditions or stipulations as any other that we know of, we will conclude this article by inferring it as a very good specimen, form, or model.
CAPITULATION.

Articles of the Capitulation signed by Abdallah Jacques Fran
cois Menou, General in Chief of the French Army now in
Alexandria, to the Generals commanding the Land and Sea
Forces of His Britannic Majesty, and of the Sublime Porte,
forming the Blockade of Alexandria, dated the 12th Fructi
tor, Fourth Nine of the French Republic, (30th of August,
1801.)

Art. 1. From the present date to the 30th Fructidor
(17th of September, 1801), there shall be a continuation
of the truce and suspension of arms between the French ar
my, and the combined armies of his Britannic majesty and
of the Sublime Porte, upon the same conditions with those
which actually subsist, with the exception of a regulation
at to be amicably settled between the respective generals of
the two armies, for establishing a new line of advanced
posts, in order to remove all pretext of hostility between the
troops.

Answer. Refused.

Art. 2. In case no adequate succour should arrive to the
French army before the day mentioned in the preceding ar
ticle, that army shall evacuate the forts and entrenched
camps of Alexandria upon the following conditions.

Answer. Refused.

Art. 3. The French army shall retire, on the first com
plementary day of the French era, into the city of Alexan
dria, and forts adjacent, and shall deliver up to the allied
powers the entrenched camp in front of the lines of the
Arabs, the Fort le Ture, and the Fort du Vivier, together
with their artillery and ammunition.

Answer. In forty-eight hours after the signing of the capitulation, namely, on the 2d of September, at noon, the
entrenched camp, the Fort Ture, and that of du Vivier, shall be deliver up to the allied powers. The ammunition
and artillery of these forts shall be also delivered up. The
French troops shall evacuate the city, forts, and dependen
cies of Alexandria ten days after signing the capitulation, or
at the time of their embarkation.

Art. 4. All individuals, constituting a part of the French
army, or attached to it by any relations, civil or military,
the auxiliary troops of every nation, country, or religion,
of whatever powers they may have been subjects before
the arrival of the French, shall preserve their property of
every description, their effects, papers, &c. &c. which shall
not be subject to any examination.

Answer. Granted; provided that nothing be carried
away belonging to the government of the French republic;
but only the effects, baggage, and other articles belonging
to the French and auxiliary soldiers who have served during
six months in the army of the republic; the same is to be
understood of all the individuals attached to the French ar
my; by civil or military capacities, of whatever nation,
country, or religion they may be.

Art. 5. The French forces, the auxiliary troops, and
all the individuals described in the preceding article, shall
be embarked in the ports of Alexandria, between the 5th
and the 12th of Vendemiaire, year ten of the republic, at
the latest (27th of September to the 3d of October, 1801),
together with their arms, flores, baggage, effects, and prop
erty of all kinds, official papers, and deposits, one field
piece to each battalion and squadron, with ammunition, &c.
&c. the whole to be conveyed to one of the ports of the
French republic in the Mediterranean, to be determined by
the general in chief of the French army.

Answer. The French forces, the auxiliary troops, and
all the individuals described in the 4th article, shall be em
barked in the ports of Alexandria (unless after an amicable
convention it should be found more expeditions to embark
a part of them at Aboukir), as soon as vessels can be pre
pared, the allied powers at the same time engaging that the
embarkation shall take place, if possible, ten days after the
capitulation shall be signed; they shall receive all the bu
tons, arms, baggage, &c. that shall not be prisoners of war, and shall moreover take with them
ten pieces of cannon, from four to eight pounders, with ten
rounds of shot to each gun; they shall be conveyed to a
French port in the Mediterranean.

Art. 6. The French ships of war, with their full com
plement, and all merchant ships, to whatever nation or in
dividuals they may belong, either of those nations at war with
the allied powers, or thole that are the property of owners
or merchants, who were subjects of the allied powers before
the arrival of the French, shall depart with the French ar
my, in order that those that are ships of war may be restored
to the French government, and the merchant ships to their
owners, or to their assigns.

Answer. Refused. All vessels shall be delivered up as
they are.

Art. 7. Every single ship that, from the present day to
the 30th Fructidor, shall arrive from the French republic,
or any of her allies, into the ports or roads of Alexandria,
shall be comprehended in this capitulation. Every ship of
war or commerce, belonging to France, or to the allies of
the Republic, that shall arrive in the port or road of Alex
andria within the twenty days immediately following the
evacuation of that place, shall not be considered as lawful
price, but shall be let at liberty, with her equipage and
cargo, and be furnished with a passport from the allied
powers.

Answer. Refused.

Art. 8. The French and auxiliary troops, the civil and
military agents, attached to the army, and all other indivi
duals described in the preceding articles, shall be embarked
on board some French or other vessels, actually in the ports
of Alexandria, as shall be in a condition to go to sea, or
on board those of his Britannic majesty, and of the Sublime
Porte, within the time fixed by the 5th article.

Art. 9. Commissioners shall be named by each party to
regulate the number of vessels to be employed, the number
of men to be embarked upon them, and generally to pro
vide for all the difficulties that may arise in carrying into
execution the present capitulation. Those commissioners
shall agree upon the different positions which shall be taken
by the ships now in the port of Alexandria, and those which
shall be furnished by the allied powers, so that by a well-regu
lated arrangement, every occasion of difference between
the crews of the several nations may be avoided.

Answer. All these details will be regulated by the Eng
lish admiral, and by an officer of the French navy, named
by the general in chief.

Art. 10. Merchants and owners of ships, of whatever
nation or religion they may be, and also the inhabitants of
Egypt, and of every other country, who may at the present
time be in Alexandria, whether Syrians, Copts, Greeks,
Arabs, Jews, &c. and who shall be desirous of following
the French army, shall be embarked with, and enjoy the
same advantage with that army; they shall be at liberty to
remove their property of all kinds, and to leave power for
the dispositions of what they may not be able to take away.
All arrangements, all sales, all stipulations, whether of com
merce or of any other nature made by them, shall be strictly
carried into effect after their departure, and be maintained
by the generals of his Britannic majesty, and of the Sub
lime Porte. Those who may prefer remaining in Egypt a
 certain
C A P I T U L A T I O N.

Article 1. The individuals composing the Institute of Egypt, and the commission of arts, shall carry with them all the papers, plans, memoirs, collections of natural history, and all the monuments of art and antiquity, collected by them in Egypt.

Article 16. The member of the Institute may carry with them all the instruments of arts and sciences, which they have brought from France; but the Arabian manuscripts, the flatlets, and other collections which have been made for the French republic, shall be considered as public property, and subject to the disposal of the generals of the combined army.

General Hope having declared, in consequence of some observations of the commander in chief of the French army, that he could make no alteration in this article, it has been agreed that a reference thereupon should be made to the commander in chief of the combined army.

Article 17. The vessels which shall be employed in conveying the French and auxiliary army, as well as the different persons who shall accompany it, shall be escorted by ships of war belonging to the allied powers, who formally engage that they shall not in any manner be molested during their voyage; the safety of such of these vessels as may be separated by furs of weather, or other accidents, shall be guaranteed by the generals of the allied powers; the vessels conveying the French army shall not, under any pretence, touch at any other than the French coast, except in case of absolute necessity.

Article 18. The commander in chief of the French army entering into a reciprocal engagement that none of these vessels shall be molested during their stay in France, or on their return; he equally engaging that they shall be furnished with every thing which may be necessary, according to the constant practice of European powers.

Article 19. Commissioners shall be named to receive the artillery of the place and of the forts, stores, magazines, plans, and other articles that the French leave to the allied powers; and lifts and inventories shall be made out, signed by the commissaries of the different powers, according to the forts and magazines shall be given up to the allied powers.

Article 20. A passport shall be granted to a French armed vessel, in order to convey to Toulon, immediately after the camps and forts before-mentioned shall be given up, officers charged by the commander in chief to carry to his government the present capitulation.

Article 21. On giving up the camps and forts mentioned in the preceding articles, hostages shall be given on both sides, in order to guarantee the execution of the present treaty. They shall be chosen from among the officers of rank in the respective armies: namely, four from the French army, two from the British troops, and two from the troops of the Sublime Porte. The four French hostages shall be embarked on board the English ship, commanding the squadron; and the four British and Turkish hostages on board.
board one of the vessels which shall carry the commander in chief, or the lieutenant general. They shall all be reciprocally delivered up on their arrival in France.

Answer. There shall be placed in the hands of the commander in chief of the French army, four officers of rank as hostages: namely, one officer of the navy, one officer of the British army, and two officers of the Turkish army. The commander in chief shall, in like manner, place in the hands of the commander in chief of the British army four officers of rank. The hostages shall be restored on both sides at the period of the embarkation.

Art. 22. If any difficulties should arise during the execution of the present capitulation, they shall be amicably settled by the commissaries of the armies.

Answer. Granted.

(Signed) Keith, Admiral.
J. Hely Hutchinson, Lieutenant General, Commander in Chief.
Hussim, Captain Pacha.
Abdoullah Jacques Francois Menou, General in Chief of the French Army.
James Kempt, Lieutenant Colonel and Secretary.

Capitulation denotes also a kind of treaty, pacta conventa, or original contract, drawn up by the electors, in the name of the princes and states of the empire, before the election of an emperor; which the emperor is to ratify before his coronation; and to observe inviolably in the course of his reign. The imperial capitulations have only been obtained since the time of Charles V., before which time the ordinary constitutions of the empire were in lieu of these capitulations. They were occasioned by the jealousy the German princes had entertained of the too great power of the emperor. Frederic, duke of Saxony, furnamed the Wife, posset for the author of the imperial capitulation; who, declining the empire, which was offered him after the death of Maximilian, advised the electors to choose Charles V. under such conditions as might secure the liberty of the empire. The design of the capitulation is, on the one hand, to prevent the emperor from abusing his power to the oppression of the people; and, on the other, to prevent the people from breaking in on the just rights of the emperor. And the principal points which the emperor undertakes to observe are the defence of the church and empire, an observance of the fundamental laws of the empire, and a maintenance and preservation of the rights, privileges, and immunities of the electors, princes, and other states of the empire, specified in the capitulation. The imperial capitulations are considered as fundamental laws of the empire; and though the drawing up, presenting, procuring the signature, and taking care of the execution of them, be committed to the electors, they are reputed the act of the states of the empire.

The king of the Romans also, when elected, signs the emperor's capitulation, as being in right of such election to succeed to the empire after the death of the emperor.

Capitulum, in Anatomy, a little head, especially of a bone, answering to the Greek condylos.

Capitulum, in Botany, the head, or compound flower of any plant; being composed of many leaves and threads or flamina, closely connected in a globe, circular or dishous figure; as the flowers of bluebottles, scabious, carduus, &c.

Capitulum, in Ancient Geography, a town of Italy, situated in the mountains above Prenele, in the country of the Hernie, according to Strabo. Pliny calls it "Capitulum Hernicum," and Frontinus "Capitulum," and says that it received a colony contrary to the law of Sulla.

Capitulum, in the Ancient Military Art, was a transverse beam, wherein were houses through which passed the wings whereby the axes of large engines, as ballista, catapult, and scorpion, were played or worked. Virro de Archib. lib. i. cap. i.

Capitulum, in Ecclesiastical Writers, denoted part of a chapter of the Bible read and explained.

In which sense they read, "he shall go in such a letter." Afterwards the place of apartment where such theological exercises were performed, was denominated domus capitulii.

Capitularia, in Ancient Geography, a town of Thrace, situated in the country of mount Rhodope. Procopius.

Capivaccio,槄cki, in Medical Biography, a native of Padua, where he arrived at the highest honours of his profession. In what year he was born is not known, but probably about 1575. In 1552, having passed through the usual degrees, he was made professer in medicine, an office he continued to hold with credit upwards, of 30 years, his lectures being always numerously attended. He was also in great request as a practitioner, and particularly famed for his skill in curing the loco venereum, by which he is said to have amased a very large property. This accounts for his refusing to remove to Pisa, though invited thither by the offer of a large salary by the grand duke of Tuscany. He wrote on every branch of medicine; and, as most of his works passed through several editions, we may suppose not unskilfully, though they are now generally superceded by newer opinions. He died in 1580. The titles of the principal of his works are, "De Lue Venerea Aeratea," "Sipir," 1595, Franc. 1594, 8vo. He first began the cure with giving the decoction of guaiacum and farfutar; thence not succeeding, he had recourse to mercurial injection.

"Methodus Practicae Medicinae, omnium Corporis Humani Curavit, Signa, et Curationes exuibus," Ven. 1591, fol. "Methodis Anatomicis, quae Aures Confessandi," edited by Teucer, with a dissertation in praise of anatomy. A compendium, containing descriptions of all the parts of the body, taken from Galen. Venet. 1593. Also, "De Factus Formationes, De Signis Virginitatis, De Urinis," &c. Thele, with several other smaller pieces, were collected and published together under the title of "Opera Omnium," fol. Venet. 1597, reprinted 1601-3, 6, and 17. Aflur De Morbi Ven. Douglas Bib. and Haller Bib. Med. Anat. et Chirurg. A malignant and fatal fever raging at Venice in 1576, Capivaccio was sent for to give his assistance in repressing it. But his endeavours not proving successful, and having unfortunately on his arrival declared the fever not to be contagious, he was sent away in disgrace. More than 100,000 of the inhabitants are said to have been swept off by the fever.

Capivard, in Zoology. See Capbara.

Capiv. See Balsam.

Capneleon, from καπνόν, smoke, and οίλον, oil, among Ancient Naturalists, denotes a species of seed, which flows spontaneously, being warmer, thinner, and more fluid than all other sorts of oils, so as nearly to approach the nature of oil, and evaporating plentifully on being exposed to the fire: whence the denomination, which imports as much as smoking oil. It is sometimes also called pflanthas, or flower of pitch.

Capnia, in Botany, from καπνόν, from, a genus formed by Venentus for the umbilicated lichens of Linneus.

Capnicyn, in Antiquity, chimney-money, or a tax which
which the Roman emperors levied for smoke, and which of consequence was due from all, even the poor, who kept a fire. This was first invented by Nicopolius.

CAPNIO, in Biography. See REUCHLIN.

CAPNISTON, among Ancient Plaetesians, denotes oil whose fumes, rendered aromatic by burning spices, are conveyed to a part affected.

CAPNITIS, or CAPNITAS Tepis, in the Natural History of the Ancients, the name of a species of chalcodony, of a brownish ground, clouded with a large tint of blackish, looking like a column of smoke. The ancients also called our common chalcodony a Jasper, not allotting any peculiar generic name to these milky stones; and the name they gave this species very happily expressed its character, because it looks exactly as if obscured, by a cloud of thick smoke. It is very common in the East Indies, and is sometimes found in Germany and France, but is seldom worked into any thing better than knife-hafts. See Chalcodony.

CAPNOIDES, in Botany. (Tourn. and Gartn.) See Fumaria, Capnoides, and Lutea.

CAPNOMANCY, a kind of divination by means of smoke, used by the ancients in their sacrifices. The word comes from capno, smoke, and maneo, divination. The general rule was, when the smoke was thin and light, a bad omen; if the contrary, it was an ill one.

There was also another species of capnomancy, consisting in the observation of the smoke rising from poppy and jellimin-seeds cast upon light coals.

CAPNOPHILLUM, in Botany, a genus formed by Gartnner for the Conium Africanum of Linnaeus, with the following character. Unbel compound, consisting of few rays; lateral rays of the partial unbel bars; central one: very short, fertile. Inclosed; very short, each consisting of about three leaves. Coarilla irregular. Fruit nearly.seffile; ridges mucronated with tubercles. See Conium Africanum.

CAPNOS, (Lobel.) See Fumaria officinalis, and Spicata.

CAPO, in Ichthyology, a name given by Paulus Jovius and some others to the fish called ececyx by the ancient Greeks, and cuculus by the Latin writers. It is presumed to be a species of trigla, most likely the modern trigla gurnardus; or, perhaps, applied indiscriminately to that species, and trigla lyra.

CAPA, Ital. the head, or beginning of any production. In vocal music, particularly in opera longa of two strains, da capo, at the end of the second strain, is an injunction to return to the beginning of the air or movement, or any part of it where this character of reference $\gamma$, can be discovered, and pursue its course as far as this sign $\gamma$, which is placed over the finale note. See Signo and Carson.

CAPO-BIANCO, in Geography, a canton of the department of the Golo, or life of Corfica, containing 6147 inhabitants.

CAPO d'Ialria, a sea-port town of Ialria, belonging to the state of Venice, the seat of a bishop, suffragan of Udina, situated in the gulf of Trieste, in an unhealthy district, near salt marshes; 7 miles S. of Trieste. N. lat. 45° 43'. E. long. 14°.

CAPOC, in Commerce, a sort of cotton, so fine and so short, that it cannot be spun. It is used in the East Indies to line palanquins, to make beds, mattresses, cushions, pillows, &c.

CAPOETAS, in Ichthyology, a species of Cyprinus, inhabiting the Cyprian Sea, and in winter migrating up the rivers. The anal fin has nine rays, the third ray of the dorsal and anal being the longest, and serrated downwards; and it has two cirri. Gmelin.

COPOLETTO, a town and port of Afa, in Georgia, seated on the Black Sea.

COPOLINIERI, a small town of the island of Elba, near the coast of Tuscany.

COPOLETTO, in Geography, a river of North America, in the province of Guaxaca, which runs into the Pacific Ocean, in miles N. E. of Tangolotargo.

COPPOLINI, in Botany, Mexicanum Hendrues, seu Copoletta daiti. Indicus. It is a tree of moderate bigness, with leaves like thofe of an almond, or our country cherry tree. The flowers hang down in bunches, which are succeeded by fruit resembling our cherries. It blossoms in the spring, and bears fruit almost the summer; it requires a temperate climate, and grows in gardens and fields in Mexico, as well spontaneously as by cultivation.

The juice of the young buds mollifies the tongue when pressed by heat. A decoction of the bark being exposed to the sun for fifteen days, and the weight of a dram of it taken, cures the dysentery. The powder helps inflammations.

In times of dearth, they make bread and drink of the fruit; but it affords an aliment inclining to melancholy, giving a rankness to the breath, and making the teeth black. There are three species of this tree, which differ only in fruit; but all of them hang in clusters.

CAPON, in Rural Economy, a cockerel, which has been culivated as soon as by the hen, or as soon as he begins to crow. Capons are useful to head chickens, ducklings, young turkeys, pheasants, or partridges, as they do it better than hens, and at the same time defend them better from birds of prey, and, from the largeness of their bones, they can cover a greater number of them, and much more completely. See Poultry.

CAPON'S Tail-grafs. See Festuca.

CAPONIER, or French Caponiere, or Caponiere, a sort of double covert-way, with a parapet on each side, sloping, and terminating in the form of a glacis. All communications of this sort and form, between either the body of the place and the outworks, or between the faltant angles of the covert-way, and either arrows or other works at the faltant angles of the glacis, or between the faltant angles of the covert way, and detached redoubts, or works advanced to some distance beyond the glacis, for the purpose of occupying particular spots of ground, to prevent an enemy's getting possession of them, may with propriety be, and sometimes are, called caponiers.

When the communication is directly opposite to the middle of the curtain, and extends from the tenailles across a dry ditch to the re-entering angle of the counter-scarp, or of the ravelin, it is from twelve to fifteen feet wide, has a banquette on each side, as also a parapet, which terminates in the ditch in a gentle slope, in the form of a glacis, at the distance of ten or twelve fathoms from its interior side. The inside of it is excavated from two to four feet below the level of the ditch, and the parapet is raised from three to five feet above the same level. It serves as a safe passage for the troops from the body of the place to the counter-scarp and outworks. Such caponiers are frequently made in dry ditches, even when there are no tenailles opposite to the curtains.

The principal use of such caponiers is to defend, directly, the passage of the ditch opposite to the faces of the bastions, and to afford the soldiers a secure communication between the body of the place and the outworks. To prevent their being seen, as they are quitting or leaving them, the re-entering angles of the counter-scarp are often partly cut off by right lines parallel to the curtains and excavations, or lodgments.
ments are made in those places, sometimes in one form and sometimes in another.

When such a communication is made between a salient angle of the covert-way and a work on one at the foot of the glacis, it is commonly from twenty to thirty feet wide, and has a traverse at its entrance, about eighteen feet thick, with a passage fix or eight feet wide round it.

When such a communication is made from a salient angle of the covert-way to a detached redoubt, or other work, advanced beyond the foot of the glacis, it is usually from thirty to thirty-fix feet wide; and when it is of any considerable length, has commonly two traverses, one at its entrance, and the other in the middle, or about half way between the work and the foot of the glacis.

It was the custom formerly to cover the exponier with thick planks, and a quantity of earth upon them, and to open small embouchures or loopholes in each parapet, for firing through on the enemy. But the smoke of the powder occasioned great annoyance and inconvenience to the men in it. It is, therefore, customary now to cover them, during a siege, only with hurdles or blinds, sufficiently to secure the men employed in defending them against flurces, which the enemy may throw into the ditch to make them abandon it. The same nuisance and inconvenience from smoke would be found to arise from the making use of fire-arms in such esquemeted galleries, with loop-holes in the counter-scarp, as those in some of the works at Portsmouth. Other arms or offensive weapons than fire-arms might, undoubtedly, be made use of in them, with much less inconvenience than miltets, and at the same time with greater effect and certainty, at so short a distance as the width of the ditch. See Fortification, § 18.

COPARALE, in Biography, an Italian performer on the violoncello, who came into England about the year 1733, and was much admired for the full and sweet tone which he drew from his instrument; which was his principal merit: for he was no deep musician, nor had he a poetical hand; yet he was always heard with great partiality by the public, and Handel frequently composed songs expressly to display his intelligible talent of tone.

COPARALI, Cesar, an Italian poet, was born at Perugia, in 1530, and having been successively employed in the service of several cardinals, died in 1631, at the fest of his patron Alcman, marquis of Carzano. As a poet in the benvilence, or burlesque style, he excelled all of those who wrote in the same style, particularly in decency of subject and imagery. His most popular piece was a satire on courts and courtiers, exposing to ridicule and contempt those who flunk into servility and wretchedness by aspiring to fortunes in an attendance on the great. He wrote also some poems of the romantic class, as his "Life of Meisson," left unfinished, and two comedies, viz. "La Scirocco," and "La Rinnettet? published at Venice in 1657. A collection of his poems, with the observations of his son, Charles, was published at Venice, in 1656 and 1662. Tribofchi, Morer. Gen. Biog.

COPARNACK, in Geography, a town and castle of Hungary, in Scelavonia.

COPAT, at Piequet, is when one of the gamellers wiss all the cards, in which case he gains forty points.

COPATO-TASTO, in Music, in high slits on the violoncello, is fluctuating the strings, by making the thumb of the left hand serve as a nut on the finger-board; by which means the four fingers can play as many passages without altering the position of the hand, as in its natural position, without shifting.

CAPOTENA, or Capotana, in Ancient Geography, a town of Abis, placed by Ptolomy in Asia.

CAPOTES, a mountain in Attica, in which, according to Plio, was one of the sources of the Euphrates.

CAP-PIGULDIA, the Capitula Edita of Ptolemy, the Ancient Provinces of Strabo, and the Parthianian Provinces of Ptolemy, a large upper map of land, drawing it in a great way into the sea, on the western coast of the ancient Buzianum, or Tanis. Upon the point of this promontory are the ruins of the city that was lost to those by Juliae, where is built a high round watch-tower. Two more of the like kind occur between this place and Syene; which are necessary guides to mariners in approaching this low and dangerous coast. To the S.E. of Capoula are the tombs and contiguous hills of the "Querables," the ancient "Carina," and "Circumus," at the diligence of five leagues. At these islands Stabo and other ancient geographers fix the beginning of the latter Syria; though Dr. W. is of opinion, it should rather commence at Capoula. N. lat. 3° 37'. E. long. 11° 25'.

COPOLI, or Capoli, one of the smaller Philippine islands, lying a little south of Laco, and three leagues in compass; the soil is fertile, agreeable, and commodious for the Indians, who live after the manner of the Bajazees.

CAPPONZVAR, a small but strong town of Hungary, seated on the river Capov.

CAPPAR, in Ichthyology, a species of Scena, having double scales on the sides of the head. Found in the Mediterranean.

CAPPADOCE, in Commerce, a sort of silk flock, taken from the upper part of the silk worm, and after the silk flock has been wound off. It is also called iasfu and cardufa, because flight fluffs under those names are made of it.

CAPPADOCIA, in Ancient Geography and History, was known to the ancients by the name of Syra or Alisyr, and borrowed the name of Cappodocia, according to Piny (l. iv. c. 3.) from the river Cappadox, or according to Herodian (apud Stephan.) from Cappadocus, the founder of this kingdom. In ancient times, this kingdom comprehended the whole of that country, which lies between mount Taurus and the Euxine sea; and was divided by the Parthians into two great provinces; and by the Macedonians, under the successions of Alexander and his two kingdoms; the one called "Cappodoci ad Taurus," and "Cappodocia Magna," the other "Cappodoci ad Pontum," and commonly "Pontus," which bee.

Cappadocia Magna, or "Cappadocia" properly so called, lay between the 18th and 41st degrees of north latitude; bounded on the north and Pontus, from which it was separated by a long chain of mountains, bearing towards the west the appellations of Lithus and Ophlinus, and towards the east the town of Parahie; on the south, by Lycaonia, and part of Armenia Minor; or, according to M. d'Anville, by mount Taurus, which separated it from Comagena and Cilicia; on the west, by Galatia and Phrygia; and on the east, by the Euphrates, and part of Armenia Minor, or, if it be made to comprise this latter province, it is almost wholly bounded by the Euphrates, which separated it from Sophene. In the time of Archelaus, Cappadocia was divided into ten prefectures, five of which lay near mount Taurus, viz. Melitena, Caramian, Cilicia, Tauris, and Hauritus; and the other five comprehended the remaining part of the kingdom, of the situation and principal towns of which Strabo has given no information. According to Ptolemy Cappadocia, to which he also annexes Pontus, was bounded on the west by Galatia; on the south by Cilicia, and part of Syria towards the Amanus; on the east by Armenia Major and
the Embrates; and on the north by that part of the Euxine sea, which extended from Amisos in Galatia to the branch of the Amusus that bounded the country on the east. The emperor Valens divided Cappadocia into two provinces, viz. Cappadocia Prima and Cappadocia Secunda, of which latter Tyana was the metropolis. The metropolis of Cappadocia, in ancient times, was Mazaica or Edhassa, called afterwards Caferara, which five. Its other cities of note were Comana, Nyfia, Nazianzum, Anablas, Dioscera, Faustipolice, Cabitira, and Sartrum, which five respectively. The principal rivers of this country were the Meias, the Halys, and the Sarus.

Whatever may have been the national character of the Cappadocians at an early period and under their first sovereigns, they were in the time of the Romans reputed lefievous, lewd, and addicted to all manner of vice; and they were deemed so infamous among other nations, that a wicked and impious man was emphatically called a "Cappadocian." The following very ancient Greek epigram, applied to the Cappadocians, is recorded by Constantine Porphyrogenitus:

"Каppаdοκοιν το ἱερόν κατά δειπνό, ἀλλὰ καὶ ἀφιείς, ἔκαθεν ὁ ἱερέας τοις καὶ νυσίν ἑλώνων."

"Cappadocam aequando vipsa mala momordit, fed et ipfa Mortua eel gultato fanguine virulentu."

It was a nation so fervile, says Strabo (l. xii. p. 372.) that when the Romans offered them their freedom to live by their own laws, they said they could not endure liberty. Cicero says of them, that they were "De Grege Venalium," whence it is inferred, that this country furnished a great number of slaves; see also Perius Sat. vi. sub fin Horat. Ep. vi. l. i. v. 59. This national character, however, underwent an important change after the introduction of Christianity; for we find among the natives of Cappadocia Gregory Thaumaturgus, Bashi the Great, and Gregory of Nazianzum.

The religion of the ancient Cappadocians was much the same with that of the Persians. At Comana they had a rich and flately temple, consecrated to Bellona, whose priests and attendants of both sexes amounted, in Strabo's time, to more than 6000. On festivals they had exhibitions of battles, in which the priests and their attendants cut and wounded each other in a transport of enthusiastic fury. They had also several other magnificent temples of Apollo, Catoeus, and of Jupiter, in the province of Marimena, which last had 5000 religious votaries. The chief priest, next in rank to that of Comana, had, as Strabo says (l. xii. p. 372.), a yearly revenue of 15 talents. Diana Perica was worshipped in the city of Callaballa, where women, devoted to the worship of this goddess, are said to have trodden bare-footed on burning coals, without injury. The commerce of the Cappadocians in mules and horses, produced in their country, was very considerable. The horses that were bred on the plains, which stretched from the foot of mount Argeus to the banks of the Sarus, were renowned above all others in the ancient world, for their majestic shape and incomparable swiftnees. Cappadocia abounded also with mines of silver, iron, and alum, and afforded alabaster, crystal, and Jasper, and probably supplied the neighbouring countries with these commodities.

It has been thought by those who have made researches into the history of ancient nations, that Cappadocia was peopled by the descendants of Togarmah, the youngest son of Gomer. In the time of Cornes the metropolis of Cappadocia formed a part of the kingdom of Lydia; and after the defeat of this prince, it became subject to the Persians, to whom the Cappadocians paid an annual tribute, as Strabo says (l. xii. p. 370.), of 1500 horses, 2000 mules, and 50,000 sheep. The most ancient king of Cappadocia, recorded in history, is Pharnaces, a noble Persian, who, having laved Cyrus from a ravenous lion, that pursued him while he was hunting, was rewarded with his father Artaxerxes, and the kingdom of Cappadocia. This country was afterwards subjugated by the Macedonians, and changed into a province; but it was restored to its former name by Ariarathes III., who, having cleared the general slaughter of the royal family by Pericles in the time of his father Ariarathes II., fled into Armenia; and availing himself of the civil divisions that took place among the Macedonians, recovered his patternal kingdom, and transmitted it to his posterity. After a succession of 10 princes, Archelaus, though not related either to the family of the Persians or that of Arishzaranes, which had possessed the sovereignty, was placed on the throne of Cappadocia by Mark Antony, to whom he continued faithful till after the battle of Actium. But having offended Tiberius by paying him no respect, during his retirement at Rhodes, he was enticed to Rome by letters from Livius, who, without discarding her son's retentment, promised him his pardon, on condition of his coming to implore it in person. Archelaus obeyed the summons; but was received by the emperor with contempt and indignation, and afterwards accused as a criminal in the senate. Although the crimes alleged against him were mere fictitious, he was so charged at being treated like a malefactor, that he is said by some to have soon died of grief, or, as others say (Tacit. Annal. lib. 1.), he laid violent hands on himself. Upon his death, the kingdom of Cappadocia was reduced to a Roman province, and governed by those of the equestrian order. Germensicus, A. D. 18, regulated the affairs both of Cappadocia and Commagena, and appointed two of his friends to the government of these provinces. In the year 73, Vespasian sent troops into Cappadocia and attacked the government of that province to the rank of confucl, instead of the order of knights. In this state Cappadocia continued till the erection of the new empire of Trebizon, with which it fell into the hands of the Turks; by whom the whole province, with the addition of Pontus, is now called Amasia, after the name of that city, where the begleber of Anatolia resides. See Amasia.

CAPPODAX, a river of Asia, which has its source in mount Amius, and discharges itself into the Euphrates S. E. of Samosara.—Also, a river of Asia which bounded the Cappadocians on the fide of Galatia, and commencing to the eall of Saounda falls into the Halys at Alpona. See Cappadocia.

CAPPGUM, a town of Spain placed by Pline in Bética.

CAPPIANUS, in Conchology, the name by which some old writers distinguished the sea- worm, or taleaceous mollusca, called by recent authors Teredo navalis. This is also known by the name of ship-worm, being that particular speccies which bores into the bottoms of ships, and to obviate the pernicious effects of which they are now generally fetched with copper from the keel to a little above the water's edge.

CAPAREA, in Ancient Geography, a town of Asia, situate in a plain of Syria, S. E. of Apamea.

CAPPARIDES, or Cappaedae, in Botany, the fourth order of the thirteenth class of Jullius's natural orders, and the eighth order of the thirteenth class in the arrangement of Ventenat; with the following characters. Caryx either many-seeded, or one-seeded divided into tegmen. Petals four or five, often alternating with the divisions of the calyx. Stamina seldom of a definite number. Germ simple, often flari-
tate or pedicelled; fleshy or pedicelled, sometimes flameniferous and glandular at its base; fleshy, or rarely one; ligula simple. Fruits many-seeded, either a fruitlet or a berry, one-celled (rarely many-celled). Seeds often kidney-shaped, either hedged in the pulp of the fruit, or allied to lateral receptacles. Perifertm none, though the interior coat of the seed is sometimes flaky and swollen so as to appear like a perifertm. Euboea seminiferum: radicle curved upon the lobes which are oblong-cylindrical, and applied one to the other. See Ventenat Pl. 15. fig. 3. Stem almost always a shrub or tree, rarely herbaceous. Leaves alternate, simple, entire, rarely ternate or digitate, proceeding from naked, scale-like buds; sometimes with two stipules, the same or glands at their base. Its genera, according to Jullien, are cleome, cadaba, capparis, fodies, cratae, morilina, and durio; the following are added as nearly allied, margarita, norraete, rafen, drofe, and paraffina. Ventenat describes under this order only cleome, capparis, cratae, and morilina; refere and paraffina as nearly allied. CAPPARIS, (Capparis, Theophrast, Dioscorides: derivation uncertain. Some suppose it originally Arabic.) Linn. Gen. 543. Schreb. 846. Willd. 1260. Joff. 243. Vent. 2, 123. Tourn. 155. Clufs and order, polyandra monographia. Not. Ord. patuminae. Linn. capparides, Joff. Gen. Ch. Cal. Perianth four-leaved or four-cleft, leathery; leaves or segments egg-shaped, concave, gibbous, caducous. Pet. four, obtuse, spreading, generally large. Stam. Filaments generally numerous, thread-shaped, spreading; anthers oblong, verifoliate, inclin'd. Fil. Germ pedicelled; frule; nigula obtusa. Peric. Berry, capsule or silique, fleshy, various in shape, one-celled, pedicelled. Seeds generally numerous, kidney-shaped.

Eff. Ch. Calyx four-leaved or four-cleft; leathery. Petals four, filaments long. Pericarp fleshy, one-celled, pedicelled. Obf. C. cantonicus is a five-leaved calyx and five petals.

* With fleshy stipules.

above; scaly-silvery beneath." Young branches, petioles, peduncles, and calyces covered, like hippocr rhinodoids, with ferruginous scales. **Leaves** alternate, petioled, acute, smooth above, but not shining like those of *C. breynia*; covered beneath with small, silvery, roundish scales, having a ferruginous dot in the middle; from three to four inches long, and scarcely an inch broad. **Flowers** rather small, terminal, several together, on short peduncles. *Siliques* five or six inches long, cylindric, a little swollen by the seeds, and of a reddish colour. A native of the Antilles, and described from a dried specimen in the herbarium of Jussieu. 34. *C. adoratiflora*, Willd. 21. Jacq. Hort. Schreb. 1. p. 57. tab. 110. "Peduncles many-flowered; leaves oblong-lanceolate, dotted with scales beneath." **Leaves** attenuated and rounded at the base, acute at the summit. **Fruits** the size of those of the common myrtle. **Petals** violet. **Stamens** a little longer than the corolla. The specific character as given by Willdenow is not sufficiently discriminative. 35. *C. longifolia*, Willd. 16. Mart. 20. Swartz Prod. 81. Pluk. phyt. tab. 327. fig. 6. "Inflorescence unknown; leaves linear-lanceolate, with mealy dots underneath." A native of Jamaica. 36. *C. jamaicensis*, Willd. 20. Lam. 22. Jacq. Amer. 160. tab. 101. "Peduncles many-flowered; leaves oblong, obtuse, marginate, downy beneath; corolla semi-crept, or bell-shaped." A shrub about six feet high, upright, branched, bushy; old branches smooth, blackish; young ones downy, ash-coloured. **Leaves** alternate, petioled, leathery, two inches long. *Flowers* yellowish white, fragrant; peduncles downy, terminal, and axillary. A native of Jamaica. 37. *C. cynophallophora*, Linn. Sp. Pl. 5, and C. flexuosa, Sp. Pl. 9. Willd. 23. Mart. 8. Lam. 13. Jacq. Amer. 138. tab. 98. C. arborefescens, frutic longifolium, Plun. Sp. 7. ic. 73. fig. 1. (Cynophallophorus, Pluk. 126. tab. 172. fig. 4. morifolia flexuosa, Aman. Acad. 5. p. 398. *Breynia folis oblongis obtusis, Browne Jam. 246. tab. 27. fig. 1. Acaecia affinis, silique tereti vetriculosa interiore tunica mucosa miniata, Sloane Jam. 1338. hift. 2. p. 59.) "Peduncles many-flowered, terminal; leaves elliptical, obtuse, smooth; glands axillar; fruit cylindrical, swollen by the seeds." Willd. A shrub twelve feet high in a good soil. **Branches** long, weak, pendant, or supported by the neighbouring shrubs. **Leaves** about three inches long, alternate, smooth, veined, on short peduncles. **Flowers** white, large, very fragrant; flowers often four inches long. **Silique** about six inches long, as thick as the human finger, opening longitudinally by two valves. **Seeds** kidty-shaped, very white, bedded in the bright scarlet fleshy, or pulp of the valves. A native of the West Indies, sent to Mr. Miller from Carthageana. Willdenow makes the flexuosa of *Linnaeus* a variety; but according to Martyn, it has been determined from an imperfect specimen in the Linnean herbarium, to be in no wise different from *C. cynophallophora*. 38. *C. verrucosa*, Willd. 22. Lam. 24. Jacq. Amer. 157. tab. 29. "Peduncles many-flowered; leaves oblong, acute, glabrous on both sides; fruit warty." Habit of the preceding. **Axillary** glands none. *Flowers* white, very open, with little smell; nectariferous glands flat, umbilicated; flowers an inch long, not much longer than the corolla. **Silique** oblong, round, green, shining, entirely covered with warts, two-valved, about an inch and half long; pulp white. Jacq. A native of thistles about Carthageana. 39. *C. frondifosa*, Linn. Sp. Plant. p. 1674. Willd. 17. Mart. 5. Lam. 12. Jacq. Amer. 162. tab. 104. "Peduncles in umbels; leaves crowded on all sides." A shrub commonly about seven feet high, but in thick shady woods not less than twenty; branches few. **Leaves** varying in size, the largest near a foot long, broad-lanceolate, acuminate, smooth, nerved, veined. **Flowers** an inch in diameter, greenish, or purple, falcate; common peduncle round, shining, erect, terminal. **Fruit** cylindrical, an inch and half long, shining, dark purple; fleshy whitish. A native of South America. 40. *C. granulata*, Linn. Supp. 263. Willd. 19. Mart. 15. Lam. 11. "Corymbs terminal; leaves egg-shaped, acute, smooth; fruit globular." A large hoary tree. **Leaves** alternate, entire, veined. **Flowers** pale yellow, in terminal corymbs, which are finally elongated into racemes. **Fruit** large. A native of the island of Ceylon. 41. *C. magnifica*, Mart. 16. Loureiro Cochin. 331. "Corymbs terminal; leaves ternate, lanceolate." A middling sized tree. **Branches** spreading. **Leaves** entire, smooth. **Flowers** large, white; calyx wheel-shaped; segments lanceolate, flat, interrupted; petals broad-egg-shaped, sharp at both ends, many-nerved, veined, spreading, equal, with long claws; filaments twenty-four, very long; anthers three-celled, oblong, recurved; germ rondh, pedicelled; style short. Berry two inches long, round, fleshy, eatable, dotted, rough, one-celled. **Seeds** numerous, kidney shaped, bedded in the fleshy, or pulp. A native of Cochinchina, much resembling *C. grandis*, and differing from it chiefly in its ternate leaves. 42. *C. oblongifolia*, Lam. 29. Forlk. Ægyp. p. 99. "Leaves oval-oblong, obfute, but ending in a sharp pointed tooth, perennial." 43. *C. mitribidactis*, Lam. 30. Forlk. Ægyp. 99. "Leaves alternate, pendulous, linear-lanceolate." Obf. The fruit of this remarkable genus merits a more accurate investigation. Authors are not agreed what it should be called in several of the species, and feem to have given it a name rather from its external form, than from a proper regard to its internal structure.

**Propagation and Culture.**—These plants can be raised in England only from seeds, which should be brought over in the capsules wrapt up in well-dried tobacco leaves to preserve them from insects. As they germinate immediately when fresh, it is not easy to get them dry to Europe; on that account they are scarce in our stoves, although many of them were cultivated by Miller. The seeds should be sown in small pots, filled with light sandy earth, and plunged into a hot-bed of tanners-bark; and should be allowed only a small quantity of water. They will frequently remain in the ground a whole year before they vegetate, and therefore require protection in winter. In the spring following, the pots must be plunged into a fresh hot-bed, and when the plants are come up, should have much air and little water. When large enough to remove, they should be transplanted finely into separate pots. In autumn they must be taken into the flove, and plunged into the hot-bed, where they should constantly remain, and be treated like other plants from the same countries, but should never have much water. Miller.

**Capparis Morifolia**, (Swartz.) See Morisonia.

**Capparis Fabago**, (Dodoens.) portulace folio, (Bauh. pin.) See Zygophyllum Fabago.

**Cappel, Lewis**, in *Biography*, an eminent French Protestant divine and Scripture critic, was born at Sedan in 1687; and becoming minister and Hebrew professor at Sauur, he disdissed himself in the controversy concerning the antiquity of the Hebrew vowel-points. His elaborate work, entitled "Arcanum punctuationsis revelationis," Leyd. 1624, contains strong arguments to prove that the points were not used by the original Hebrew writers, but were added to the text by the Mafortes. He also maintains, that the characters of the Hebrew text were those used by the Chaldeans after the Babylonish captivity, and that before that period the Jews always employed the Samaritan character. The members of the reformed and Lutheran churches
churches were alarmed by this hypothesis, conceiving that it tended to diminish the authority of Scripture, and to reduce it to a level with tradition. The Roman Catholics, on the other hand, eagerly adopted it. It is affirmed, however, that the leaders of the reformation, Luther, Zwingle, and Calvin, were of the same opinion, and the hypothesis is now very generally received. Cappel, unmindful of opposition, pursued his plan, and in his famous work, entitled "Critica Sacra," fol. Paris, 1650, produced a number of various readings, and a list of the errors of抄写ists in the Bible, accompanied with critical remarks. See PUBLISHERS.

The printing of this work was delayed for 10 years, by the opposition it met with at Geneva, Sedan, and Saumur; till at length a son of Cappel, who was a convert to popery, obtained permission by the intercess of fathers Patai, Morin, and Merienne, to print it at Paris. It was warmly attacked by John Buxtorf, in his "Anticriticus," and by other divines; but Grotius, in a letter to the author, expressed his approbation of the work. Cappel likewise published "Sacred Chronology," Paris, 1655, which is printed by Wolton in the Preliminary to his Polyglott. After his death were published his "Commentaries, theological and critical, on the Old Testament," together with the defence of his "Aretium," at Amsterdam, 1689, fol. This learned writer died at Saumur in 1658. Moret, Molinie, E. H. vol. v. p. 377, &c.

CAPPET, in Geography, a place of Switzerland, in the canton of Zurich, where, on account of a religious dispute, a battle was fought between the Catholics and Protestants, in 1551, in which Zwingle, the reformer, lost his life; 9 miles S. of Zurich.

CAPPET, or Waldkapel, a town of Germany, in the circle of the Upper Rhine, and principality of the Upper Hesse, 22 miles S.E. of Caffel.

CAPPET, or Kappel, a small but neat town of Denmark, in the duchy of Sleswic, on the east coast; 16 miles N.E. of Sleswic. It contains about 550 inhabitants, who are industrious, and carry on some trade, exporting bacon, cheese, butter, eggs, and other commodities to Copenhagen, and supplying the interior parts of the province with coffee, sugar, spices, and other foreign merchandise. The environs of Cappel are very pleasant, being grounds gently rising, sprinkled with much wood, and commanding fine views of the bay. N. lat. 54° 44'. E. long. 10°.

CAPPELLA, Ital. a chapel. This substantive is rendered a musical term on many occasions, as manifesto di cappella, a chapel master, or the director and composer of a chapel establishment, a chorister. A cappella, music in a chapel or church style. But the title of manifesto di cappella is not confined to ecclesiastical composers and masters of a choir, but is extended to composers of an opera, and to composers in general. Nor does cappella always imply that a prince or nobleman who retains a band of vocal and instrumental performers in his service, has choral duty daily performed in his chapel; but that he has a band for his evening or occasional concerts, in his palace or mansion; as was the case with the duke of Chandos, at Cannons, in the beginning of the last century.

CAPPELLINE, in Heraldry, a mantling, or a sort of covering or hood, represented entire; not cut, and hanging back over the neck of the wearer. See Mantling.

CAPPELLO, Bernardo, in Biography, a celebrated Italian poet, was born at Venice about the beginning of the 16th century, and imbibed from Bembo, with whom he was intimate, the principles of Italian poetry. To his judgment, however, Bembo submitted his own poems. Cappello, in consequence of an opinion maintained by him in the Senate,

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to the city. This happened about the year 1770. He was author of several abridgments, metaphysical works, feinting the humour of the time; but what alone seems deserving notice, is his account of a fatal epidemic prevailing in the island of Sicily, during the years 1771 and 2. " De Morti Epidemo qui miserrime Siciliam despossebat, Anno M.DCCCLXXI triduoque 1772, Caufis, Symptomatibus, et Curatione," McLeans, 159., 4to. Halket Bib. Med. Lloy, Dict. Hist.

CAPPRA, in Geography, a small Greek island, N.W. of the isle of Staeo, inhabited only by goats; its wine imports.

CAPPRA, in Zoology, a genus of the Mammalia class in the order Pecora.

The quadrupeds of this tribe have the horns hollow, turning upwards, and bent back, compressed, and rough: from teeth in the lower jaw eight: canine teeth none: chin bearded.

There are the goats of English writers, including our common goat, and its numerous varieties. The species of this genus already ascertained are few, amounting only to two, or three at the utmost, if the domesticated goat, Capra hircus, be considered as the genuine offspring of either of those species known in the state of nature at this time. It is thought by many, and the opinion is highly probable, that our common goat originated from the Capra alpine, Capra aegagrus, or perhaps from the fore goat, Capra ibex, of Linnæus. We can lay but little as to the third species that might have been the parent stock of our present race of domestic goats, the Capra canescens of Gildedenflein described in the Transactions of the Russian Academy for the year 1779; because it appears rather doubtful whether we ought to admit it as a species altogether different from capra aegagrus, or not.

In the twelfth edition of the Systema Naturae, the capra genus will be found far more extensive; Linnaeus having classified several animals of the antelope tribe as species of this genus. The Swedish naturalist was unquestionably justified in this respect, both by his own opinion, and by the example of ancient writers which scarcely an exception from the time of Pliny. They had, for instance, uniformly considered the chamois as appertaining to the race of goats; it was their repica, and even to this day it passes under the trivial name of the chamois goat, though in the systematic writings of modern zoologists it chiefly in the genus antelope. That the natural generic distinctions, if they may be so expressed, observable between the goat and the antelope tribes did not strike the mind of Linnaeus may be preferred as evident; there was but an inconsiderable number (about six species) of the antelope known in his time, and those he placed without hesitation with the goats in his genus capra.

The observations of later naturalists prove sufficiently that Linnaeus might have separated the goats from the antelopes with much propriety: were we to disturb the truth of this assertion, the writings of Pallas, of Schreber, Erxleben, Gilldenflein, Pennant, and Sommii mult siletc every doubt. Grubin, the editor of the last edition of the Systema Naturae, has availed himself of these recent authorities, the antelopes are separated from the goats under the generic name of antelope; the goats retaining the original appellation of capra.

A principal distinction between the two genera consists in the structure of the horns, those of the antelope being round and nearly cylindrical, and either twisted spirally, or annulated: the teeth are exactly the same in both; but the chin of the goat is bearded, while that of the antelope is not. A further very striking difference between the goat and the antelope is observable in the general figure of these animals. The goat is robust, strong, vigorous, petulant, and...
and feale; the antelope is of a graceful form: its limbs long and slender; its disposition timid, harmless, active, and watchful; and in the chase, when pursued on the open plains, its course incomparably more fleet than that of the goat.

Besides, therefore, the peculiar structure of the horns, and other characteristic particulars laid down by systematic writers, the manners and habits of life sufficiently prove that a line of separation ought to be drawn between the antelope and the goat. Mr. Pennant in his preface to the Synopsis of Quadrupeds treats of this subject at some length; his remarks are useful, and although they relate more immediately to the antelope than the goat, the leading points of his argument may be properly noticed in this place. The antelopes (says this author), two or three species excepted, inhabit the hottest parts of the globe; or at least, those parts of the temperate zone that lie near the tropics as to form a doubtful climate. None, therefore, except the saiga, and the chamois, are to be met with in Europe; and notwithstanding the warmth of South America is suited to their nature, not a single species has yet been discovered in any part of the new world. Their proper climates seem, therefore, to be those of Asia and Africa, where the species are very numerous. As there appears a general agreement in the nature of the species that form this great genus, it will prevent needless repetition to observe, that the antelopes are animals generally of a most elegant and active make; of a velvet and timid disposition; extremely watchful; of great swiftness; remarkably light and agile; and most of their movements so light, so elastic, as to make the spectator with astonishment.

Antelopes generally reside in hilly countries, though some inhabit plains; they often browse like the goat, and feed on the tender shoots of trees, which gives their flesh an excellent flavour. This is to be understood of those which are taken in the chase; for those which are fattened in houses are far less delicious. The flesh of some species is said to taste of musk, which perhaps depends on the qualities of the plants they feed upon. This principle (says Pennant) was thought necessary, to point out the difference in nature between the antelope and the goat kind, with which most systematic writers have classed the antelopes: but the antelope forms an intermediate genus, a link between the goat, and the deer; agreeing with the former in the texture of the horns which have a core in them and are never call; and with the latter in elegance and swiftness.

From the tenor of the preceding observations it will be perceived that the late Sir and well-informed zoologists consider it as a decided point that the antelopes and the goats ought to be separated, and we shall therefore speak of the species of Capra as they stand independent of the genus antelope.

**Capra ibex.** Horns on the upper surface knotty, and bending over the back: throat bearded. Brill, reg. an. — Lisa.


Steinbock is the familiar title, by which this animal is better known than any other. The name is derived from the German *stein* and *bock*, or buck of the rock, conveying at once an idea of the animal, and the situations in which it delights, and is commonly found. The French name bouquetin is of German origin, and in England the species is better known by the name of steinbock, than that of ibex goat, as it is called by Pennant. In its general appearance it resembles the common goat, but it is considerably larger, more vigorous, and more active. The colour is a deep brown or greyish brown; much paler, or steel in females, and on the inside of the horns; the outside of the horns are dark, or blackish on the lower part; but it is marked with a distinct black line. The body is of a fine, thick, flat and compressed; the ears are small, but full of fire and expression. The horns in the male are extremely large, measuring from two to three feet in length, and weighing eight or ten pounds; they are of a dark blackish colour, and are marked on the upper surface with transverse prominent terebentes, which it is reported indicate by their number the age of the animal, one additional being formed every year. These horns are thick at the base; and sometimes become so prodigiously large as to extend the whole length of the body. The female is smaller than the male; her horns are smaller in proportion, less distinctly marked with semicircular protuberances, and much weaker than those of the male. The legs are short, but the males are very short, and the hoofs short. The tail is small and of a blackish colour. The young steinbocks are of an ash-coloured grey.

The ibex is found in several parts of Europe and Asia; and it is said on all the great chains of mountains in the northern parts of the ancient hemisphere; upon the Alps, the Pyrenees, the Apennines, and Tyrol. In Asia it occurs on the summits of the chain of mountains extended from Taurus, and continued between Eastern Tartary and Siberia. It also inhabits the tract beyond the Lena, and is said by Vercy to be a native of the mountains of Kamtschatka. In Arabia it is not uncommon, and in the high mountains of the island of Crete it appears to be abundant.

In its general habits or manners this animal resembles the common goat, but possesses every attribute of strength and activity in a degree proportioned to its natural state of wildness. It inhabits the most inaccessible places among rocks and precipices in the hill regions of the mountains, where it finds all that is necessary for its frugal subsistence in the midst of solitude and security. Somnial observed them on many of the loftier elevations of the mountains in the island of Candia, and several other islands in the same sea, and beyond the upper half of Mount Olympus he found there were hardly any quadrupeds to be seen, except a few bears, and the bouquetin, or mountain-goat, capra ibex, who appeared to be sole masters of this solitary waste of nature.

The chase of the steinbock, like that of the chamois, is both difficult and perilous. When it retreats among the crouches and precipices it is impossible to pursue the animal in safety; the chase is then left to the dogs who are taught to hunt them over the most tremendous pales of the mountains amid ice and snow, where many of the dogs are sometimes lost in the vain attempt to follow or overcome their game. But should the mountain hunter once get sight of the steinbock at a distance from his dogs and within the range of his rifle piece he instantly takes an aim, and seldom fails to wound or kill the animal at the first fire. It is in this manner they hunt both the steinbock and the chamois on the Tyrolese mountains. The flesh of the young ibex is said to be in esteem as an article of food; that of the old ones is also eaten, and its fleece and skin employed for various purposes. We may further add that this is the animal whose whole blood was formerly considered as a valuable article in the materia medica, being celebrated for its supposed power of relieving pleuritic and many other complaints. Of its wonderful virtues in this way much has been related in the works of Gofner and Aldrovandus. Its period of gestation is five months as in the common goat.
Capra. "The origin of the domestic goat (says Mr. Pennant in his British Zoology) is the ibex, or wild goat, a species now found only in the Alps, and in Crete." The facts already related in the history of capra ibex clearly prove the writer to be mistaken in affording it to be found only in the Alps and in Crete; the observation is merely introduced to show that he believes the ibex to be the parent stock from which the domestic goat originated.

To ascertain the point in a satisfactory manner is perhaps impossible; we must allow our opinions to fluctuate, between probabilities and conclusions without concurring in our own minds the chance of arriving, with any absolute shrewdness, of the truth. Pallas allows that capra ibex may have been the original from which the domestic goat is derived, at the same time that he is inclined to think with equal probability it may have derived its origin from capra aggrus, the caucasian ibex of Pennant. The latter notion seems most prevalent; Cuvier adopts it; and we are led to think on a point: to ambiguous, not entirely without reason.

Buffon considers the capra ibex, the chamois antelope, and the domestic goat, as one and the same species. He speaks of it as likely that the male ibex coupling with the female chamois may have given rise to the present domestic race of goats.—"There are many cases (says this lively writer in another place) in which we cannot distinguish characters, nor pronounce on differences with certainty; there are others in which we are obliged to suspend our judgment and opinions; and in a great number of others we have not the slightest ray of light to direct us; for independent of the uncertainty arising from the contrariety of affections relative to recorded facts: independent of the doubts resulting from the insufficiency of those who have endeavoured to observe nature, the greatest obstacle to the advancement of knowledge is our ignorance of a great number of effects which time has not disclosed to us."—"We are ignorant whether the chamois goat be any thing more than the common goat in a wild state, or whether an intermixture would not form an intermediate race."—The naturalists of France, though proud of their immortal Buffon, cannot accede to his insufficient flight of his imagination. Sonnini, the editor of the last edition of his works, speaks of it as erroneous. Another French writer was more explicit: "It is absurd (he thinks) to suppose with Buffon that our race of domestic goats were produced from an intermediate breed between the bouquetin (capra ibex) and the chamois; an inspection of the exterior characters, and the internal organization of the three animals, to say nothing of their manners of life, seems to destroy all ideas of their being specifically the same." That the present race of goats cannot be the direct offspring of the cros breed between the ibex and the chamois, as Buffon thought, seems unquestionable; yet we think it pretty certain, from the evidence above adduced, that they may be the descendants of capra ibex, or bouquetin, and in that case that the dimmitude between the internal organization of the capra ibex and that of the common goat cannot be very apparent as our author pretends. This is an interesting point for the comparative anatomist to determine. An account was published in the French Journal de Phys, for October 1786, to prove that the capra ibex sometimes couples with the domestic goat, and produces mongrels. The fact was ascertained by M. Berthoud van-Berchem who saw an instance of it in the Valais, where the inhabitants rear numerous herds of tame goats, and the bouquetin is found in a state of nature among the mountains. It was long before well known that the goat will couple with sheep, the hybrid produce of which differs very little from the natural offspring.
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offspring of the ewe and ram, except in having a hairy instead of woolly fleece. We have yet to learn that an intermixture of the goat and sheep may be productive of a breed of fertile males, as Buffon seems to think very possible.

The history of the common goat has been very amply treated on by many writers, so that we can do little more than repeat the observations of others in this place.

The goat, in its domestic state, is found in almost every part of the globe, bearing the extremes of heat and cold, and differing in form according to various circumstances. It appears to have been originally confined to the old world, from whence it was transported to America. P. Browne seems to intimate that it is an aborigine of the island of Jamaica; but this is improbable; it is believed on very sufficient authority that it was entirely unknown to the Americans till after the discovery of America, when it was introduced by the Europeans.

This animal, observes Buffon, is superior to the sheep both in sentiment and dexterity. He approaches man spontaneously, and is easily familiarized; he is capable of curiously, and capable of a considerable degree of attachment; he is stronger, lighter, more agile, and less timid than the sheep; he is a spirited, capricious, wandering, wanton animal. It is with much difficulty that he can be confined, and he loves to retire into solitude, and to climb, stand, and even sleep on rugged and lofty eminences; he is robust, and capably nourished, for he eats almost every herb, and is injured by very few; his bodily temperament, which in all animals has a great influence on the natural disposition, is not essentially different from that of the sheep. These two animals, whose internal organization is almost entirely similar, are nourished, grow, and multiply in the same manner; and their diseasedsf are the same, excepting a few to which the goat is not subject. The goat fears not, like the sheep, too great degree of heat; he cheerfully expels himself to the sun, and sleeps under its mol hottest rays without being affected with the vertigo, or any other inconvenience; he is not afraid of rain or storms; but he appears to feel the effects of severe cold. The incongruity of his disposition is marked by the irregularity of his actions. He walks, hops, short, runs, leaps, approaches, or retires, hews, or conceals himself, or flies off as if accelerated by mere caprice, and without any other cause than that which arises from an eccentric vivacity of temper; the suppleness of his organs, and the strength and nervousness of his frame, are hardly sufficient to support the pertinacity and rapidity of his natural movements.

When penned along with sheep, goats always take the lead of the flock. They love to feed separately on the tops of hills, and prefer the most elevated and rugged parts of mountains. They find sufficient nourishment in healthy, barren, and uncultivated grounds. They do infinite mischief when permitted to go among corn, vines, copes, or young plantations; for they eat with avidity the tender bark, and young shoots of trees, which generally proves fatal to their growth. They carefully avoid moist ground, marshy meadows, and rich pastures. They are seldom reared in plain countries, where they never thrive well, and where their flesh is always bad.

The male goat is capable of engaging when he is a year old, and the female at seven months. But as the fruits of their early coupling are generally weak and defective, they are commonly restrained till they are eighteen months, or two years old. The he-goat is handsome, vigorous, and ardent, and one is sufficient to accompany an hundred and fifty females for the space of two or three months; but his ardour, which soon consumes him, does not last more than three or four years, and by the age of five or six, he becomes nearly enervated. In the selection of a he-goat for propagation, attention should be paid to his strength and age; he should be large, and about two years old; his neck short and flutiey; his head florid; his ears pendulous; his thighs thick; his limbs firm; his hair black, thick, and soft; and his beard long and bushy. The choice of the females is a matter of consequence, observing only, that those with large bodies, thick thighs, who walk light, have large udders, and soft bushy hair, are the most preferable. They are in season from September to the end of November, though they will couple and produce young at all times. The smell of the goat is highly unpleasant, that of the male especially. During the months of September and October, the whole atmosphere around them is filled with their strong disagreeable odour, and which, though as disagreeing as affecting us, in the idea of some naturalists, may perhaps be conducive to the prevention of many distempers, and to cure those of a nervous and hysterical kind. Horses are supposed to be much refreshed with it, on which account, many people keep he-goats in their stables or stables.

The female produces one kid, sometimes two, very rarely three, and never more than four: she carries her young five months, bringing them forth about April; and is in condition to breed from the age of seven months till she is seven years old. The he-goat, as before said, will propagate as long, if proper care be taken of him, but other-wise becomes useless two or three years sooner. He is then sent to fatten among the common herd. The strong smell of the goat does not proceed, it is said, from his flesh, but his skin. These animals are seldom permitted to grow old, or perhaps they might live eleven or twelve years; but it is usual to fatten and kill them as soon as they cease to multiply, because the older they are the worse is their flesh. The goats are animals that cost very little for their food, and in cold, mountainous countries are attended with considerable advantage: their flesh, tallow, hair, and skin, are all valuable commodities. Their milk is said to be more wholesome and better than that of the sheep; it is used in medicine, curiously calied, and makes very good cheese. The females, says Buffon, will allow themselves to be painful by infants, to whom their milk affords very excellent nourishment. "Like the cow and sheep, (continues this writer) they are affected by the weather, and also by the bird called in France l'angouleme, (the goat-fucker,) which fattens to their uses during the night, and, as some say, makes them lose their milk for ever after." It may be almost superfluous to point out the absurdity of this whimsical idea, founded, as we must believe, on the grossest prejudices of rustic ignorance; this notion is certainly entertained among the lower classes of peasantry, both in our own country and in France. It is a matter of surprise to many, that Sonnini in his edition of Buffon's works, has not endeavored to correct this error, or explain it to our satisfaction. The renderings with which the female goat will allow herself to be foolish by other animals, is indeed well known. Of this; Sonnini has given a very striking instance; he assures us that in the year 1788, he saw a foal which had lost its mother, nourished by a goat, which during the process, was placed on a barrel, in order that the foal might suck with the greater convenience. The foal followed its nurse to pillage, as it would its parent, and was attended with the greatest care by the goat, which always called it back by her bleatings when it wandered to any distance from her.

The colour of the goat is various, being either black, brown, white, or spotted. Those of Wales Mr. Pennant thinks far superior in size, strength, and fineness of the hair,
CAPRA.

to those of other mountainous countries: the goats of France, and the Alps, being generally short-horned, reddish, and small-horned; while the horns of the Cambrian kind have been seen three feet two inches long, and branching three feet further between the tips. "The fact of the goat is in great esteem, as well as the hair. Many of the inhabitants of the mountains breed cattle, and keep their animals to glean the reed on which they drive them in October, for the sake of the hair, either by flooding them with bullets, or running them down with dogs, like deer. The goats killed for this purpose are about four or five years old. Their fact will make candles, far superior in whiteness and goodness to those made from that of the sheep or the ox, and accordingly brings a much greater price in the market: nor are the horns without their use: the country people making of them excellent handles for tucks, and prokaries. The skin is peculiarly well adapted for the glove manufacture, especially that of the kid: abroad it is dressed and made into flockings, beds-tucks, bolster, bed hangings, frills, and even shirts. In the army it carries the foot-soldier's provisions. As it takes a dye better than any other skin, it was formerly much used for hangings in the houses of people of fortune, being susceptible of the richest colours; and when flowered and ornamented with gold and silver, became an elegant and superb furniture."

The fleece is of great use to the inhabitants of the country, where it refines, and affords them a cheap and plentiful provision in the winter months, when the kids are brought to market. The haunches of the goat are frequently fatted and dried, and supply all the uses of bacon: this, the natives is called eelb yr euden, or hung venison."

The meat of a fleshy goat of six or seven years old (which is called bfr.), is reckoned the best: being generally very sweet and fat. This makes an excellent patty; goes under the name of rock venison, and is little inferior to that of the deer. Thus nature provides even on the tops of high craggv mountains, not only necessaries, but delicacies for the inhabitants."


The above passages are selected from Pennant's description of the Cambrian goats, as they contain much useful information. It should, however, be mentioned, that those observations were written above thirty years ago, and are not in every particular applicable to the present state of things in Wales, where English manners, and English husbandry are making rapid innovations. The goat is an animal, we may strictly say from our own very recent observations, but sparingly cultivated at this time in the principality. The culture of this useful animal has been on the decline for the last twenty years, and is now almost wholly confined to the mountainous parts of Caernarvonshire: a small breed of sheep that thrive admirably well on the mountains, where goats were formerly kept, have superseded them: the rearing of cattle, and especially sheep, is considered more beneficial and respectable by the modern Welsh farmer. We have observed goats in greater numbers among the tremendous cliffs that overlook the paws of Pont-Aberglaslyn, than in any other parts of North Wales. In South Wales the goat is seldom seen.

The skin of the goat is readily converted into parchment, and it is also frequently used by the leather dressers for making what is termed Morocco leather: the best skins for this purpose are those of the Côrific breed of goats. The manufacturer, we also learn, can imitate the chamois leather so exactly with the skin of the goat, that the difference is scarcely to be discerned.

CAPRA Angora. γ. Body covered with very long, pendent, spirally curled hair.

CAPRA Angora. β. Chèvre d'Angora, Buff, &c.—Armenian, Penn, &c.

The Angora goat is in general of a beautiful milk-white colour, with short legs, and black spreading spiral twisted horns. The hair on the whole body is deposited in long pendant spiral ridges if it is even a pendent, and the horns of the female, instead of curling inward, as the male, turn outwardward, and are much shorter in proportion.

In its native country the animal is highly valued, and with sufficient reason, for it is a source of riches to its cultivators; the small, and most costly rubies of the highest classes in Turkey being fabricated of its silky fleece: the price it bears is very great. Most of the European nations have agents for purchasing the valuable wool of this animal, which the Turks, it is reported, will not allow to be sent out of their empire in a raw state, but in the form of thread; a multitude of the poorer orders obtaining a livelihood by spinning it. The most considerable manufacture of carders, fabricated with this wool in Europe, appears to be that of Lille and Amiens, in France. In order to preserve this beautiful hair in good condition, the goat-herds of Angora are peculiarly careful of their flocks, washing and combing them with the greatest diligence; and it is said that a change of pasture frequently makes them lose their beauty; this variety being naturally confined to narrow bounds, and produced only in the tract surrounding the towns of Angora and Beilbazar, two places situated in a small district of Asia Minor, not far from Smyrna, and remarkable for producing a peculiar race of sheep, cats, and rabbits, as well as goats, with hair of uncommon length and fineness.

CAPRA Mambria. γ. Horns recumbent; cars pendulous; chin bearded.

CAPRA Mambria, Linn.—Capra Syriaca, Driff.—Graffen mit kragendem Ohren, Runolff.—Chèvre Mambrie, ou chèvre du Levant, Buff.—Syrian goat, Penn.

This variety of goat takes its name of Mambria from a particular mountain, called Mambre, or Mambra, situated in the middle part of Palæstine, near the river Hebron, where they abound. The variety is common in many parts of the Eil, and is principally distinguished by the great length of the cars, which are pendulous, and sometimes reach so low as to inconvenience the animal while feeding. It is reported by travellers, that the owners of these animals, on such occasions, cut off one of their cars that they may feed with greater ease. This, however, is denied by Sonini and other French writers, who assure us that the cars of this goat never reach so low as the ground, and are never cut off. Its general colour is reddish, with short blackish horns. This is the common goat of Aleppo, the inhabitants of which are supplied with milk. The fame is the caique at Cairo, where these goats are driven in small flocks every morning through the different quarters of the city, and every one fees taken from them the quantity of milk they want.

CAPRA Dermo. γ. Horns small, deformed, and closely incumbent to the skull.

CAPRA depurata. Linn.—Capra porra Americana, &c., Driff.—Bouc d'Afrique, Buff. &c.—African goat, Penn.

This is a small variety, or dwarf kind of goat, found in some parts of Africa. The French call the male bouc d'Afrique, and the female, la chèvre naïve. This kind has rough, hair, and extremely short horns, which are very thick, triangular, and lie close to the head; in the female they are still shorter. Dr. Shaw observes, that Linnaeus seems to have entertained an erroneous idea relative to the native country of this variety, and to have suppos’d it an American animal. We may add, that although the animal was originally a native of Africa, it has been long since transported
Abalilus waged war against Perseus. Such was, he tells us, seen at the mouth of Augustus.; another on the tragedy of Sophocles; and at the death of Herakles.

CAPRA Rufostris, 6. Horns erect, and received at the tips.

Hex parvum Americanus, Brist. — Bene de Judá, Chiôro de Judá, Brist. — Whistle goat, Penn.

Herds of this species of goat, are cultivated in most parts of Upper Egypt. This is a dwarf variety, found in various parts of Africa. It is said to be also very common in Guiana and Angola. The flesh is considered an excellent food.

There is a variety of this kind with longer horns; the hair is long and silky, and the whole animal bears some resemblance to a small Aegypt goat. Buffon describes it as being considerably larger than the other, measuring two feet nine inches in length; while the other was only twenty-four inches long. Buff. Suppl. pl. 13.

CAPRA Capricorni, 6. Horns short, turned forwards at the tips, and annulated at the sides.

Ia capricornis, Buff. — Capricorn goat, Penn. — Capricorn goat.

A variety described by Buffon from a skeleton with the horns, preferred in the king's cabinet at Paris. The animal is supposed to be a native of Africa. In the form and proportion of the bones, Buffon tells us it bears a perfect resemblance to the domestic he-goat; and the figure of the under jaw is the same as that of the wild goat; but that it differs from both in the horns; those of the wild goat having prominent tubercles or knobs; and two longitudinal ridges, between which there is a well marked anterior face: those of the common goat have but one ridge, and no tubercles. The horns of the capricorn have but one ridge, and no anterior face; and though they want the tubercles, they have rugosities which are larger than those of the male domestic goat. Those differences, adds Buffon, seem to indicate an intermediate race between the wild and domestic goat; and, besides, the horns of the capricorn are short and crooked at the point, like those of the chamois; and at the same time are compressed and ringed; and hence, they seem to partake of at once the he goat, the wild goat, and the chamois. This variety appears to be feebly known, except from the description of it given us by Buffon.

CAPRA COTTA, in Geography, an inaccessible town of Naples, in the county of Molfet, seated on an eminence; 13 miles N.W. of Molfet.

CAPRA Saliens, or CAPRA Salinares, in Meteorology, a fiery meteor, or exhalation, which sometimes appears in the atmosphere, and is not fired in a straight line, but with inflexions, and windings in and out, resembling the caperings of a goat. The capre saliantes are not so called from their figure, which is various, sometimes round, sometimes long, but, from their moving by jerks, somewhat like the leaps of that animal; and from the little augments of fire which hang at, and sometimes fall from, them, which antiquity has been pleased to fancy like the beards or locks of a goat's hair. Ariostello distinguishes the capra from the trs, in that the latter proceeds with an uniform motion, the former with an irregular one, and as it were by jumps. Ariost. Met. lib. i. cap. 5. Mem. Ac. Infer. tom. vi. p. 95.

The capra seem to be very low, yet sometimes fly so high, that meteorologists have placed them in the upper region, though not so constantly, but they are sometimes found in the middle region. Of globular capra we have divers instances, in ancient as well as modern naturalists. Such was the flame said by Seneca to have been seen in form of a huge ball, about the biga of the moon, when Paulus

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five flames. See Xyaresia. 2. C. crasifera, Linn. Mant. p. 87. Mart. 3. (Carus, Rumph. Amb. v. p. 491. tab. 170. fig. 3. C. Capraria uniforma. Brum. Fl. Ind. p. 153. tab. 14. fgr. 3.) Leaves opposite, egg-shaped, feecloped, on very short pedicels. Stems herbaceous, much-branched, four or five feet high. Leaves opposite, rather acute. Flowers axillary and terminal; peduncles simple, longer than the leaves. Linn. says that it resembles his caprarias gracilis, but that the leaves are more egg-shaped and petioled. Willdenow has omitted it. 3. C. lucida, Willd. 2. Mart. 6. Hort. Kew. ii. p. 353. "Leaves opposite, oblong, acute, sharply and minutely serrated, even; pedicels winged; peduncles three-flowered." Whole plant smooth. Stems quadrangular, biennial. Leaves an inch and half long; pedicels half an inch. Flowers axillary, a little longer than the pedicels; exterior pedicels sometimes three flowered; bracts awl-shaped, the length of the pedicels; segments of the calyx awl-shaped, three lines in length; corolla suffrutescent; tube cylindrical, pale purple, a little longer than the calyx, gibbous on the outside at the base, a little bent above, then erect, a little elongated on the outside; border horn-yal; segments egg-shaped, obtuse, equal, reddish purple, with a dark purple spot near the throat; throat hairy; anthers oblong, compressed; germ roundish; style shorter than the calyx; stigma large, convex, oblique. Hort. Kew. Willdenow observes that the fruit is a two-celled berry, as it probably is in all the Cape species, since they agree with it in the habit of the flower; and that, therefore, they may not improperly form a distinct genus. A native of the Cape of Good Hope: observed by Maillon. Introduced at Kew, in 1774. It flowers in April and May. 4. C. lanceolata, Linn. jun. Supp. 284. Willd. 3. Mart. 5. Hort. Kew. ii. p. 354. "Leaves opposite, lanceolate, entire; racemes compound, terminal." Stem shrubby. Root twossed long and more, acute, thick. Flowers in a terminal panicle, composed of short racemes. Found at the Cape of Good Hope by Thunberg and Maillon. Introduced in 1774. 5. C. semitellata, Willd. 4. Vahl. Ecol. ii. p. 47*. "Leaves lanceolate, serrated outwards; peduncles sometimes many-flowered." Stem herbaceous, erect, round below, angular above, intermixed with short hairs. Leaves two or three inches long, alternate, thick-fleshed, spreading, narrowing at the base into the petiole, acute, smooth on both sides, serrated from the tip to the middle, then entire. Flowers axillary, and terminal; peduncles scarcely half an inch long, pubescent, from one to four flowered; pedicels alternate, approximate, very short; bracte one at the base of each pedicel, linear-lanceolate, a little longer than the pedicel; segments of the calyx awl-shaped; corolla longer than the calyx, hairy at the bottom; segments five, linear-oblong; stigma capitate. Capsule oblong, a little longer than the calyx, two-furrowed, two-valved, splitting into two. Seeds numerous, very small, affixed to a linear, long receptacle. Vahl. A native of St. Martha, in America. 6. C. undulata, Linn. jun. Supp. 284. Willd. 5. Mart. 5. Hort. Kew. ii. p. 354. L'Herit. Sert. Ang. p. 21. "Leaves opposite, oblong-egg-shaped, entire, waved; upper ones somewhat heart-shaped, in whorls; racemes resembling spikes." Stem shrubby. Found at the Cape of Good Hope by Thunberg and Maillon. Introduced in 1774. 7. C. hastata, Willd. 6. Mart. 7. Hort. Kew. ii. p. 354. "Pubescent; leaves opposite, or in threes, egg-shaped, ferrated, petioled; peduncles axillary, shorter than the petiole." Root annual. Found in the East Indies by Dr. I. G. Koening. Introduced in 1781, by Sir Joseph Banks.

Propagation and Culture. The first species is propagated by seeds, which must be sown upon a hot-bed in the spring, and to bring them forward should be afterwards planted upon another hot bed. About the middle or end of June they may be transplanted either into pots of rich earth, or into a warm border, where they will ripen their seeds in autumn in the open air. The Cape species may be increased by cuttings, and are less tender. Martyr's Miller.

Caparia Gratiosioides, (Linn.) See Lindernia pyxidaria.

Caparia Durianifolia, (Linn.) See Staphyloct durianifolia.


Caparies. (Gra. Virg.) See Lecnea minor.

Caparia, in Geography, one of the Trench islands, in the Adriatic, about 4 leagues from the coast of Italy; very small, and uninhabited. "N. lat. 42° 16'. E. long. 13° 36'."

Capraienses, in Ancient Geography, an appellation given to mountains of Africa, in Maurania, which were inaccessible, and also to the inhabitants of these mountains.

Caprasia, a town of Italy, in Britton. — Allo, the name given by Pliny to one of the mouths of the river Eridanus, or the Po.

Caprata, in Ornithology, a species of Motacilla, of a black colour, with the rump, vent, and spot on the wing-coverts white.


Caprea, in Zoology. See Capreolus and Cervus.

Capreolus, in Ancient Geography. See Capri.

Capreolus, in Ectology, a species of Palaegae, (Cochen.) The wings flexuose, cinceres, with three oblique white streaks, and two lagnata. Inhabits Germany. Larva naked, green, and feeds on the willow.

Caprellus, that species of Aphis, that infests foxis caprea. This is small, of a greenish colour, with pointed abdomen; and the eyes, antennae, and tips of the legs black. Fabr. &c.

Capreolate Plants, in Botany. See Capreolus.

Capreolus, in the Ancient Architecture, a sort of rafters or timbers serving to sustain the cantier, either in buildings, or machines. They were thus called, not, as Philander imagines, from their resemblance to the capreola, or tendrils of vines, but from the affinity of their form and office to wild goats; as these butt and repel things with their horns, so do the former oppose their heads or horns to the weight of the cantier.

Capreolus, in Botany, a term used by the old botanists for a tendril, or caliper, called by Linnaeus circulus.

Capreolus, in the Ancient Hyphenary, a kind of iron hook or instrument with two forks or tongs, wherewith to stir and move the ground.

Capeolus, in Zoology, a species of Cervus, the foe of English writers. See Cervus.

Capri, in Geography, an old name of the Mediterranean, about three Italian miles from the coast of Naples, about eight miles in circumference. Although it is so mountainous that its coasts are almost inaccessible, some parts of it are very fertile; and it abounds so much with various birds of passage, and more especially with quails, that the greatest part of the bishop's income arises from the taking of these and the hunting of other game. Hence this island has been called the "biloporic of quails." Swinburne, (Travels, vol. iii. p. 7) informs us, that even in bad years the number of quails caught in this island amounts to
amounts to 12,000; and that in good years it exceeds 60,000. On the eastern summit of Capri are cliffs of stupendous altitude that overhang the channel, which separates this island from Capo Campanella, anciently called "promontorium Athenium, or Minervae." The island of Capri or Caprace is famous in history as a place often visited by the emperor Augustus both for health and recreation; and as the retreat of Tiberius, A. D. 27, where he abandoned himself to indolence, intemperance, and the most infamous debauchery. In this retired abode he spent a great part of ten years, secluded from the world, and wallowing in brutal debaucheries, the detail of which has been transmitted to us by many authors of unquestionable credit, although some of the practices which they recite seem to be incompatible with his advanced age and complicated infirmities; however, the obscene sculptures and medals, which have been dug up in almost every corner of the island, sufficiently prove that the charge against him is well founded. On the site of his summer palace now stands the hermitage of Santa Maria, commanding a most enchanting prospect. Tiberius, in order to vary his pleasures, and to enjoy the advantages as well as to avoid the inconveniences of each revolving season, built twelve villas in different situations, dedicated to the twelve greater gods, of some of which the ruins are still to be seen. At Santa Maria are extensive vaults and reservoirs, and on an adjoining brow are the remains of a light-house; two broken columns indicate the entrance of the principal court. At the palace of La Marina, Tiberius had a winter residence; where columns and other fragments of architecture scattered on the fards remain as memorials of its splendour. A semicircular recess of neat work, the "opus reticulatum" of Vitruvius, raised against the cliff, seems to have been a part of the theatre; and the conduit that supplied the palace with water still exists. The ruins stretch far into the sea, which has now submerged the territory from which it had formerly been expelled by terraces and piers. Here the soil is richly vegetative, and composed of diverse layers; a deep stratum of good mould covers a yellow hole, under which lies a stone exactly similar to the tufs of the volcanic hills round Naples. The palace was built with this stone, but in the abutments and back walls are inserted large pieces of lava in a rough flake of terracotta, like that of the crust of Vesuvian flaxes when cooled; yet the upper rocks of Capri are universally calcareous, and homogenous with the tufs of the Sorrentine mountains, of which they appear to have been a part till split asunder, and cast off by an earthquake that buried the intermediate grounds in the sea. These lower tracts in Capri have probably been thrown up by fire in the midst of lime-stone mountains, in the same manner as the plan of Sorrento. According to Dion Cassius, this island was wild and barren before the Greeks took it under their protection; at this day a large portion of its surface is uncultivated and impracticable; but every spot that will admit the hoe is industriously tilled, and richly laden with the choicest productions of agriculture. The odium attached to the memory of Tiberius proved fatal to his favourite abode. Scarcely was his death proclaimed at Rome, ere the senate issued orders for the demolition of every fabrick he had raised on the island, which, by way of punishment, was thereto forward defined to be a state-prison. The wine andol of Cumaeans were banished to its inhospitable rocks, which were soon filled with their blood. In the middle ages Capri became an appendage of the Amalfian republic, and, after the downfall of that state, belonged to the duchy of Naples. About a mile from the fourth side of this island are two or three pointed rocks, the "Scopoli Sirenae," mentioned by Virgil and Ovid in their description of Aeneas's voyage.

"This island," says Swinburne, "reminds us a variety of hazards and advantages, that it was not the fitter to me, who dwell on our unthrifty countrymen restored a man of an intrepid philosophical cast, to have been hai with a scene for meditation and bodily enjoyment; the temple of the air and the excellence of the fruits would secure his health; and the delightful scenery round him would dispel hia cares, and give an even cheerftul flow to his spirits."

Capri, a town of the island above described, seated in a narrow, low, but delightful and fertile spot of land, between two rugged eminences, which form the extremities of the island, and appearing at a distance by its cupolas and buildings to be a considerable place, but on a nearer approach dwindling to a village. It is the seat of a bishop, hifignam of Amala. It is 17 miles S. of Naples. N. lat. 30° 34'. E. long. 15° 38'.

CAPRI, in Ancient Geography, a part of Macedon, which, according to Mela, lay between mount Athens and the river Styron.

CAPRIANUS Muns, a mountain of Sicily, in the vicinity of the town of Hecalea.

CAPRIATA, Pier Giovanni, in Biographia, an historian of Genoa, who flourished in the 17th century. His Italian history comprehends the transactions that occurred in Italy during his own time, which he has related with clearness, and with facility traced to their causes; maintaining at the same time, as he says, a perfect impartiality between the powers of France and Spain, that were concerned in them. The two first parts of this history were published by Capriata in his life-time, from 1613 to 1644; and the third part, extending to 1660, was published by his son after his death. The whole has been translated into English. Gen. Dict.

CAPRICCIO, It. a musical term for a wild, irregular movement, but full of fire and fancy. It is generally intended to display execution in the performance of new and ingenious passages, with the freedom of an extemporaneous flight. During the last century, the caprice of Vivadi, Veracini, and Locatelli, were in high favour.

CAPRICE is applied, in Architecture, to an edifice of a singular tablet, and deviating much from the common rule of building.

CAPRICERVA, in Zoology, one of the synonyms of antelope cervicapra; which see.

CAPRICKE, in Geography, a town of France, in the department of Essaut, and chief place of a canton, in the district of L'Ecluse. The place contains 3239, and the canton 15,429 inhabitants. The territory comprehends 125 kilomètres and 8 communes.

CAPRICORN, the Goat, in Astronomy, a southern constellation and the tenth sign of the zodiac, from which also the tenth part of the ecliptic takes the same denomination. This was one of the 48 constellations received from the Egyptians by the Greeks.

The character whereby Capricorn is represented in astro-nomical writing, is \( \frac{\lambda}{2} \) or \( \frac{\lambda}{2} \), of which the other is an imitation. The former is a kind of resemblance of the crooked horns of t'goat, and the latter of the animal itself.

As to the figure of this constellation, the Greeks pretend that Pan, in order to avoid the terrible giant Typhon, threw himself into the Nile, and was changed into this figure; and that, in commemoration of this exploit, Jupiter took it up into heaven. But it is more probable, as Macrobius observes, that the Egyptians marked the portion of the heavens appropriated
priated to this sign, where the sun begins to ascend towards the north, with the figure of a goat, which is an animal that delights in climbing the sides of mountains.

The ancients accounted Capricorn the tenth sign, and when the sun arrived there, it made the winter solstice, with regard to our hemisphere; but the stars having advanced a whole sign towards the call, Capricorn is now rather the eleventh sign; and it is at the sun's entry into Sagittary, that the solstice happens: though the ancient manner of speaking is still retained.

The stars in the constellation of Capricorn, in Ptolemy's and Tycho's Catalogue, are 28; in that of Hevelius 29; though it is to be observed, one of those in the tail, of the sixth magnitude, marked in Tycho's book the twenty-seventh, was lost in Hevelius's time. Mr. Flamlleet, in the British Catalogue, enumerates 51 stars in this sign.

It is represented on ancient monuments, medals, &c. as having the fore-part of a goat, and the hind-part of a fish; which is the form of an ag(g)ia; and sometimes, simply, under the form of a goat.

For Dr. Heber's account of the latitude and magnitude of the stars in Capricorn, see Phil. Trans. vol. ixxvi. p. 199. 217. vol. lxxxvii. p. 259.

Capricorn, tropic of, a lesser circle of the sphere, parallel to the equator; passing through the beginning of Capricorn, and determining the winter solstice, or the point of the sun's greatest south declination. See Tropic.

Capricorn beche, in Entomology, the trivial English name of Cerambyx longimanus, which bee.

Capricorn-goat, in Zoology. See Capra Capricornus.

CAPRICORNE, the same given by Buffon, and other French writers, to Cattus capricornus, which bee.

CAPRICORNUS, a variety of the goat, Capra aegagrus, with short horns, that turn forward at the apex, and are annulated at the sides. See Capra.


Capricornus niger cornutus, Muf. Petrop. 672, is Cerambyx latius of Linnaeus.

Capricornus ruficus of Petiver, the insect called by modern entomologists Cerambyx editus.


M. Tournefort affirms us, that this method is still practised every year in most of the Grecian islands; and he admired the patience of those who spend above two months in carrying the flies from one fig-tree to another. Caprification is formed from caprificus, the wild fig tree, from whose fruits the insects are produced, which are the chief instruments of caprification. This tree bears three different species of fruit, called furnites, cratirites, and orni, which answer no other purpose but that of facilitating the above operation. The furnites appear in August, and contain little worms, hatched from eggs deposited by flies; in October and November, these worms become flies, which pierce the second figs called cratirites, which do not appear till the end of September: these figs continue to the month of May following, and furnish a lodgment for the eggs of the second class of flies. In May, the third species of figs, called ornis, appear; and when they are grown to a certain size and begin to open at the eye, they are pierced by the flies produced by the cratirites, or winter-figs. When the worms bred in these spring figs are transformed into flies, which happens in the months of May or July, the peafants gather them, and transport them to the garden fig-trees. The success of the caprification depends on this circumstance, and therefore they visit their wild fig-trees and their garden fig-trees every morning, to examine the eye of the fig; by which they judge when the flies are about to infuse from the wild figs, and when they may be applied to as to pierce the garden figs. They are then deposited on such trees as are fit to receive them, and take care that the fruit by the eye, where they lay eggs, the worms of which cause the garden-figs to attain their proper degree of bigness and maturity. The consequence of this operation is, that garden fig-figs, which would scarcely yield twenty-five pounds of ripe figs, and fit for drying, yield two hundred and eighty pounds.

As to the manner whereby the puncture of the flies contributes to the maturation of the fruit, possibly it may be by lacerrating the vessels, and extravagating the nutritive juice when they deposit their eggs; with the egg they may also convey some liquor which gently ferments with the juice of the fig, and softens its pulp. Even the Provence and Paris figs ripen much sooner by wounding their buds with a straw or feather dipped in oil-olive; plums and pears also wounded by insects are found to ripen the soonest, and in these the pulp about the wound is more exquisite than the rest. Mem. Acad. Science, ann. i. 705. p. 447. fqq.

Olivier, in "Nouveau Dictionnaire d'Histoire Naturelle," speaks of this practice as merely the effect of a vulgar error manifested by its high antiquity, and affirms that, after a long reflection in the islands of the Archipelago, he is convinced of its fruitfulness. Caprification, he observes, is unknown in many countries of the East, has not been adopted in France, Italy, or Spain, and has lately been discontinued in several islands of the Archipelago, where it was formerly in use, and yet, nevertheless, good figs are produced in all those countries. The assemblance of the Cynips, or fig-fly, he alleges, cannot be necessary to render the young gums fertile, since each fig contains near its eye a sufficient number of male flowers to impregnate all the female ones within its cavity; and that if it were necessary, the pollen of the wild fig tree, which is supposed to be conveyed by the fly to the germs of the cultivated kind, could not fecundate, at the same time, those which have attained to a considerable size, and those which have but just, or have not yet appeared, and which do not ripen till two months afterwards. In answer to the latter part of the objection, it may, however, be remarked, that Tournefort particularly mentions the strict attention paid by the Greek peafants to the exact time when the orn of the wild should be placed upon the garden fig tree, and that every part of the crop must be supposed to have the needful supply at its proper season. We may also add, that the reasoning employed by Olivier does not at all apply to Tournefort's conjecture concerning the proximate ends of the effect produced. The proper question to be considered is not whether the fig can produce fertile seed without the aid of the fly; of that no well-informed naturalist will entertain a doubt; but whether the fruit of the cultivated tree is increased in size, and heightened in flavour, by the operation. But still it may be asked, why does not the puncture made by the fly occasion a similar extravagation of the nutritious juice of the wild fig, or convey to it the same fermenting liquor, and thus improve its native qualities? The subject, it must be acknowledged, is attended with difficulties which have not yet received a satisfactory solution. But it is surely an unwarrantable degree of scepticism, on account of the same, to discredit the relations of able observers, founded on the experience of ages. Olivier refers to some interesting and instructive
instructive memoirs published by Bernard on this subject, which we have not at present an opportunity to consult.

Caprifolium is also applied, in a less proper sense, to the art of propagating the palm-tree. Act. Edin. Linn. 1721, p. 84.

CAPRIFICUS, in Botany, the name of the wild fig-tree.

CAPRIFOLIUM, a third order of the eleventh class of Jussieu's natural system. It has the following characters: Calyx one-leaved, superior, often divided, or bracteated at its base. Corolla generally monopetalous, either regular or irregular; in a few instances polypetalous, petals united by a broad base. Stamens of a definite number, often five; in the monopetalous genera always inserted into the corolla, and alternating with its segments; in the polypetalous ones sometimes placed upon the pistil, alternating with the petals, and sometimes fixed to the middle of each petal. Gyno inferior; style generally single, sometimes none; stigma single, or rarely three. Fruit, either a berry, or a one or many-celled capsule; each cell with one or many seeds. Corolla of the feed in a large upper cavity of the leaf, solid perisperm. Stem either a shrub or a tree; rarely herbaceous. Leaves in mull, opposite; in a few, alternate; Bipinnate alone.

It is divided into four sections: 1. Calyx calycis, or bracteated; style single; corolla monopetalous. Linnæus, trioleæ, ovidea, sylphoricarpos, dievrella, xylócorus, and caprifoliöm. 2. Calyx calycis or bracteated; style single; corolla polypetalous. Linnæus, vicium, rhézhophora. 3. Calyx bracteated; style none; stigmas three; corolla monopetalous. Viburnum, hortensia, fimbriatus. 4. Calyx simple; style single; corolla polypetalous. Cornus, he-dra.

CAPRIFOLIACEÆ, the third order of the eleventh class of Ventenat's natural system, with the same characters, divisions, and genera, as the Caprifolia of Jussieu, except that ovidea and Hortensia are omitted. The plants of this family are generally reckoned astringent.

CAPRIFOLIUM, a name given by the old botanists to several plants which Linnæus afterwards placed in his genus Lonicera. Tournefort confined the term to such species as have their flowers in heads, with an irregular two-lipped corolla. Jussieu and Ventenat extend it to all that have flowers in heads, or in axillary, single-flowered whorls, including those with a corolla nearly regular, the Periclymena of Tournefort. Gertner seems to have comprehended under his Caprifolium, the whole Linnæan genus Lonicera, having restored the latter name to the Laronthus of Linnæus, some of whose species had been called Lonicera by Pl minim and others. The name, it may be allowed, was changed by Linnæus without sufficient reason; but Gertner has in fact only increased the confusion, in attempting to remove it.

CAPRIGLLIA, in Geography, a town of Naples, in the province of Benevento, 13 miles S. of Benevento.

CAPRIMA, in Ancient Geography, a small town of Asia Minor, placed by Diótorus Siculus in Caria.

CAPRIMULGUS, in Ornithology, a genus of the order Passeres, the goat-peeker of the English, and Pengouwelet of French authors. The character of the genus consists in having the bill slightly curved, very small, subulate, and depressed at the base; mouth extremely large, and fringed at the sides with a series of bristles; ears ample; tongue short and very entire; tail not forked, and containing ten feathers; legs short; middle claw with a broad ferrated edge. Thus far we follow Gmelin, but we have, to observe, that, although this definition of the Caprimulgus genus is applicable to most of the species, there are some with which it will not agree. In Caprimulgus grandis and jamaicensis, for example, the claw of the middle toe is not ferrated, and it is supposed there are other species described, on the testimony of former authors, that are distinct of this Gmelinian character. Gmelin confounds with Latham in considering the entire figure of the tail as an essential character of the genus, but there are species known that have the tail banded, and others that contain white feathers in the tail instead of toes, which latter is considered by both those writers as an essential criterion, among others, of the Caprimulgus genus. The species defined are 21 in number.

CAPRIMALUS gemonis, the grand goat-peeker of Latham. B渐an, Gonomous Maximus, Ray. I. grand spume, and Gouar, vol. de Géographie de Buffon. This is particularly distinguished by being of a blackish colour, variegated with white and yellow; beneath white and black; area of the eyes yellowish; legs white. Lath. Ind. Orn. Blackish, varied with rose-coloured spots and streaks; middle claw not ferrated. Gmelin.

This gigantic species of goat-peeker was supposed to be the largest of its race till the recent discovery of Caprimulgus megacephalus in the Australasian regions, and was therefore named specifically grandis. It is nearly the height of a small yard, measuring 2½ inches in length. The bill, which is three inches long, is covered near the tip with hairs, that completely conceal the mouth. The plumage is blackish, varied principally with whitish and cream-coloured spots and marks on the upper parts of the body. The wings are brown on the outer edge; feathery feathers chiefly white; quills deep brown, slightly barred with white on each side, and the shafts black. The wings reach almost to the end of the tail, which is 1½ inches in length, rounded at the extremity, and of a brown colour, with seven or eight narrow dotted bars of white. Its legs are brown, and covered near the toes with feathers; middle claw not ferrated. Inhabits Cambodia, where it is said to secrete itself within the hollow of some decayed tree in the day-time, especially such as stand near the water. Willoughby's figure of the great ibijou is copied from one given by Mecgrave, that is not very remarkable for its accuracy, both a crested and being erroneously represented on its head. There is a specimen of this bird in the Leverian museum.

CAPRIMALUS megacephalus of Latham, Pengouenlet megacephale of Vielot. A species superior in size to Caprimulgus grandis, lately discovered in New South Wales. The length of this bird is 25 inches. General plumage blackish brown, variegated and streaked with yellowish and dull white; breast dirty-ferruginous; belly black; wings and tail spotted, and banded alternately with black and whitish. The head and neck appear of a large size from the abundance of feathers with which those parts are covered. The bill remarkably stronger than any other of the goat-peeker tribe, its colour pale brown, and fringed at the base with a series of feathers, much longer than the rest, that stand nearly erect, and form a kind of crest. The legs are yellowish.

CAPRIMALUS jamaicensis, the Jamaica goat-peeker. The plumage of this species is ferruginous, streaked with black: wings variegated with white; quill-feathers brown, with white spots; tail barred with black. Lath. Ind. Orn. Caprimulgus jamaicensis, Gmel. Gatera queens, Ray, Buffon, &c. and Mountain owl of Brown.

This kind, though inferior in size to the former species of goat-peeker, is a large bird, being about a foot and a half in length. Shaw describes it in his history of Jamaica, but mistakes it for a kind of wood owl, and Brown has fallen into a similar error. The bill is of a black colour, and much bent downwards at the tip, corresponding in this particular with the
the lower mandible, which is also bent in the same direction, and close exactly together when the mouth is shut; the nostrils are covered with feathers. The irides are reddish-yellow, and the eyes are surrounded with a disk of feathers not unlike those of the owl tribe, and which appear to have deceived both Sloane and Brown. The upper parts of the head, neck, and body are composed of a mixture of ferruginous and black, streaked longitudinally; the wing-coverts are parti-colored, of a deep call, and partly ferruginous and fuscous varied, and irregularly dotted with blackish, and forms of the inner ones with a mixture of white. The quills are of a deep black brown, marked on the outer edge with eight or nine white spots. Its tail is seven inches long, cinereous, dotted with black, and crossed with seven or eight bars of black brown. The legs rather large, feathered to the toes, and armed with black claws, the one middle of which, as in the former bird, is not ferrated. This species, as its name implies, is a native of Jamaica, where it is reported to be uncommon; it inhabits woods, and feeds principally on insects.

**Caprimulgus griseus, grey goat-fucker.** General color grey; wings black, with pale grey lines; tail brownish grey with fuscous lines. Gmel.

A species thirteen inches in length, that inhabits Cayenne; the bill is of a brown colour above and yellow beneath; tail five inches in length, and scarcely extending beyond the length of the wings when the bird is at rest. Buffon, who describes this species, calls it *Penguenevent gris.*

**Caprimulgus corniculatus, Carolina goat-fucker of Catteby,** a kind distinguished by having the upper part of the plumage waved with grey and blackish; beneath reddish-grey, with small blackish lines; three exterior tail-feathers white on the inner edge. Ind. Occ. "Supra linea transferens amphisis alternis atris et griseis variis, subitus ex rufo griseo lineis nigricantibus longitudinalibus, cauda griseo atrato cancellata." Gmel. We have adopted Dr. Latham's specific character of this bird, in preference to that of Gmelin, as being more expressive. The species inhabits Virginia and Carolina, and, like the rest of the goat-fuckers, appears only on the wing in the evening, or when the sky is obscured with heavy clouds preceding rain. The North Americans, it appears from Brown and other writers, call it the rain-bird, in allusion to the latter circumstance. It is the short-winged goat-fucker of the Arctic Zoology.

This does not exceed the common European goat-fucker in point of size. The bill is dull; upper parts of the head, neck, and body transversely variegated with zig-zag alternate lines of dusky-brown and grey; the crown has also some spots of the latter colour, and on the wings are both spots and longitudinal yellowish and dusky flecks. The sides of the head, and all the under parts, are rufous-grey, marked with longitudinal blackish lines; the gape of the mouth along the jaw on each side is white, and beneath this are a few yellowish spots; quills barred with dusky and grey, and spotted on the outer webs with yellow; on the inner web of the three first is a large white spot. The tail is four inches long, of a grey colour, with dusky bands and lines; legs brown, claws black, the middle one ferrated. This bird is said to lay its eggs on the ground, and it appears they very much resemble those of the lapwing.

**Caprimulgus Guianensis, the Guiana goat-fucker.** Colour tawny, streaked and spotted with rufous; beneath the throat a white lunar band. *Le monteveyau de la Guiane, et Terre-cbovre roux de la Guiane de Buffon.*

This kind, which inhabits Guiana, is nine inches in length. The bill is about three quarters of an inch in length, and is beset with bristles. The general colour of the plumage full.

vous, with an irregular mixture of rufous throughout; on the top of the head, and hind part of the neck the flecks are longitudinal, but on the upper part of the back oblique, as well as mixed with spots of an irregular shape on the ruff of the upper parts. Beneath, the plumage much resembles that above, but the spots or markings are most placed in a transverse direction. From the gape arises a white band, a light rufous-bar along the jaw and under the throat. The quill-feathers are black, the first five or six, marked with a white spot. Tail three inches long, and extending an inch beyond the wings when they are closed. This bird, we are informed, is frequently observed to repeat the three syllables *mont-ray-au* very distinctly, when flying abroad at twilight in search of prey.

**Caprimulgus rufus, the rufous goat-fucker, the engoulevent roux de Cayenne of Buffon, and Crapeaud solvant, ou Terre claire de Cayenne, Pl. Enl.** The species is distinguished by being of a rufous colour, varied with black in longitudinal flecks; wings, and lower part of the body fuscated with blackish; quill-feathers varied with rufous and black, in alternate fringes.

Somewhat larger than the foregoing species, being ten inches and a half in length. It inhabits Cayenne. The bill is of a pale brown colour; the irides yellow; and the plumage varied as before described, with rufous, black, and a few white spots. The throat is marked transversely with lines; the lower part of the body is also lined, but the lines increase in breadth as they pass backwards, the upper part of the belly is blackish, the lower rufous. The tail is banded with black, and exceeds the wings by half an inch. The legs are flesh colour.

**Caprimulgus Europeaus, the European goat-fucker.** The colour black, varied with cinereous, fuscous, ferruginous, and white; beneath rufous-white, with fuscous bands. "Niger, cinereo, fusco, ferrugineo et alba varius, narium tubis obsoletis." Linn. Fm. Suec. *Nocturnal goat-fucker,* Pennant.

The European goat-fucker, as it generally called, is a native of Asia and Africa, as well as Europe. Its length is ten inches and a half. The plumage is of a deep blackish colour, beautifully speckled and diversified with spots of grey, ferruginous, and white. The tail is four inches long; the legs short, rough, or scaly, and feathered much below the knee; the toes connected together on each side by a flight membrane, and the middle claw ferrated. The plumage of the male is brighter than that of the female, and it is best known by having an oval white spot on the inner webs of the three exterior quill feathers, and another at the tip of the outer feathers of the tail.

A variety of this species is reported to have been brought from China by Sonnerat. This was rather larger, and the colours somewhat darker, than in our common kind; the feathers of the wings were black, marked with yellow spots, each inclining a black dot in the centre; and the whole were so dimphosed, that, at the first glance, the wings appeared to be marked transversely with seven alternate bands of yellow, and the like number of black ones.

Fern owl, chun-hawk, dorr-hawk, and night-jarr are the most familiar provincial names of this common goat-fucker in various parts of England. Latham calls it the European goat-fucker, this being the only bird of its genus that is found in Europe. It commonly arrives in England the latter end of May, and remains in the southern parts of the island till about the end of September. In its passage from the eastward, it visits Malta, and the south of Europe, a month sooner than England; and it is seldom earlier than November.
CAPRIMULGUS.

November. Some French authors assure us, that several birds of this species have been shot in the woods of Volges in the middle of winter, but such occurrences are very rare. The species has been recently observed in Siberia and Kamtschatka, where it lives not only in forests but also in open countries, where it finds rocks, or high banks, for shelter. With us it lives in woods, and feeds on insects, which it collects on the wings, in the dusk of the evening and morning, like the owl, and remains secreted, like that nocturnal bird, in the hollow of a tree, or some dark recesses, during the daytime. By chance, however, it has been noticed on the wing in the daytime when disturbed in very gloomy weather. It is a great destroyer of the cockchafer-beetle, many of which, with other insects, are usually discovered in its stomach on digestion. The note of this bird is singular, resembling the noise of a large spinning-wheel, or as some liken it to that of the letter K frequently repeated, and which is said to emit only when perched on the branch of a tree, with its head hanging down in the dusk of the evening. Besides this, it has a sharp squeak, which is supposed to be its call of love, as the male is observed to utter it when its partner of the female makes its manner of perching is curious, for it almost constantly places itself longitudinally upon the branch, instead of across, like other birds. The goatucker was accused by the ancients, and many of the elder writers, of fouling the teats of goats, and it is from this vulgar prejudice its popular name of goatucker is derived; this absurd notion, though countennanced by Buffon, is jutly exploded by all modern authors. The female makes no nest, but lays her eggs upon the bare ground, or loose crags, without any apparent care; they are usually two in number, of a white colour, and blotched with bluish brown.

CAPRIMULGUS Virginianus, Virginian goatucker. Colour brown, varied with grey and reddish; beneath reddish-white, transversely streaked; chin with a triangular white spot; area of the eyes and neck above spotted with orange.

This is smaller than the European goatucker, its usual length being eight inches, but those the myosibos-hoock of Hudson's bay, described on the authority of Mr. Hutchins by Latham, in his Supplement, prove to be the same bird as is generally suspected, it sometimes attains to the length of nine inches and a half. All the upper parts of the body are of a dull brown, transversely variegated and blended with rufous brown, and an intermixture of ash-colour, with a slight proportion of grey on the wings; the neck and sides of the neck, and the sides of the head, are a rufous brown, variegated spot, spotted with orange at the under part. The quills are dusky, the first five marked with a white spot about the middle; tail marked similar, the two outer feathers with a spot of white near the extremity; legs flesh-colour, middle claw ferrated.

During the summer, this bird inhabits Virginia, where it first arrives about the middle of April, and frequents the mountainous parts, but will frequently approach the housetops in the evening, when it commonly settles on a rail or pole, and cries for several times together very loud, somewhat like the word whip-poor-will, or whip poor-will, pronouncing the frict and laft syllables loud and clear. The noise of this bird, which is both loud and disagreeable, continues oftentimes the whole night, and it not unfrequently happens that four or five birds of this fame species keep in company, and cry in concert together. They subbit chiefly on insects. The eggs are of a greenish colour, with dusky spots and streaks. Kalm speaks of the flees of this bird as an article of food.

Linnaeus appears to have confused this as a variety of the common or European goatucker, Caprimulgus Europæus. Both Catesby and Buffon call it whip-poor-will, in allusion to its note; it is the long-winged goatucker of the Arctic Zoology, and Virginia goatucker of Latham.

CAPRIMULGUS vitatus, striped goatucker, and frangovent a bandeir noible of Vielott. A new species recently discovered in New Holland, where the English settlers call it the mosquito hawk. This bird is about nine or ten inches in length; the upper part of the head and neck are black, with a stripe of the same colour running, in the form of a crescent, behind the eyes. The black stripe on the upper part of the neck descends on each side to about the middle; where it divides into two distinct branches. Those parts of the head where the black does not appear is of a pale carnation or flesh colour. The upper portion of the neck, with the body beneath, are of a somewhat similar colour, but more inclining to ferruginous. Under the eyes, sides of the neck, and upper part of the wings are marked with spots and transversal lines; back and wing-coverts obtuse blue, speckled with black; quills blackish, spotted and edged with rufus-colour; tail-feathers dark brown spotted with ferruginous, and slightly forked; bill large, and of a black colour; legs reddish-flesh colour.

CAPRIMULGUS albicollis, white-throated goatucker of Latham. The plumage is rufous brown, varied with white and blackish streaks; beneath brownish with black lines; a triangular white spot on the throat; tail somewhat cuneated.

Length ten inches and a quarter; bill brown with the tip black, and the nostrils rather prominent; head streaked with black, upper parts of the body the same, but more obscure; the scapulars, and most of the outer wing covers have a black band near the end, and the tips yellowish buff-colour; latter quills spotted with rufous cream-colour on the outer web, the greater dusky black, and crossed about the middle with a white bar; tail somewhat wedge-formed, the third feather white, second white within and black without, the outermost with a white spot near the base; legs brown; middle toe very long; and greatly ferrated. Described by Dr. Latham, from a specimen in the collection of general Davies, that is suppos'd to have come from Cayenne.

CAPRIMULGUS femitoratus, white-collared goatucker of Latham, is described on the authority of Buffon, who calls it le petit engoulvent de Cayenne; Gmelin calls it femitoratus. This bird is blackish, varied with rufous and grey, with a white muzzle on the lower part of the collar. Length eight inches, and inhabits Cayenne.

CAPRIMULGUS Brocilatus, Brocilian goatucker. Plumage yellowish black, varied with white specks; beneath varied with black and white; area of the eye yellowish white.

Size of a swallow. Bill and eyes blackish; wings and tail even; legs white, the middle claw ferrated at the outer edge; tail expanded. This, as the name implies, inhabits Brazil.

CAPRIMULGUS acutus, blear-tailed goatucker, and l'engoulvent ocurgenne de la Guiana of Buffon. This kind is readily distinguished by the pointed tips of the tail-feathers from the rest of the species in the same tribe; the plumage is blackish, faciliated above with grey, and beneath with rufous; head and collar reddish brown. It inhabits Guiana, and is about seven inches and a half in length. The shafts of all the tail-feathers are bare of webs at the tips; bill and legs black.

CAPRIMULGUS Cayennensis, Cayenne, or white-necked goatucker. Plumage rufous and grey, varied with black undulated lines; throat and stripe on the wing white; temples rufous, with five black streaks. Caprimulgus cayanus, Latham.

Described
Described on the authority of Buffon, who calls it the *Pensoulevent de Cayenne*, as being seven inches and a half in length. Bill black, iridescent yellow; head and neck tinged with rufous; lower part of the belly spotted with black; two middle feathers of the tail grey, crossed with five or six blackish bands; the rest black, bordered with white; legs yellow brown. This bird inhabits Cayenne, where it is found in the plantations, and when on the wing is said to utter a weak cry, which has been compared to that of the toad, and it has also another note that somewhat resembles the barking of a dog. It is not a timorous bird by any means, neither is it a race species.

**Caprimulgus Americanus**, American goat-fucker, distinguished specifically, according to Gmelin, by having the nostrils very prominent and cylindrical. The plumage is variegated with black, grey, and ochreous brown.

This is a Linnaean species, *Caprimulgus Americanus* of that name. Ray calls it the small woodowl, as does his wife School, in his History of Jamaica; it is *Pensoulevent de Bayonne*, ou le balzar of Buffon, and other French authors. This bird is seven inches in length; the bill black, and becet with bristles; the nostrils projecting about one-eighth of an inch; legs and claws grey. Like the rest of its tribe, this kind feeds on insects. It is found in various parts of America.

**Caprimulgus Nova Hollandia**, crested goat-fucker of Philip's Voyage to Bany bay. This is of a brown colour, clouded with black and white, and white beneath; neck and breast with dull rufous bands; eret on the front and face are brown. Inhabit New Holland, and is rather smaller than the European goat-fucker. The length is nine inches and a half. Its bill is black, cape wide, and yellowish within; behind the base of the upper mandible arise a crest of twelve bristles, which are thinly bearded at the sides; quill-feathers brown, the five or six exterior ones with whitish spots on the outer side; tail rounded, fuscois, with twelve whitish bands clouded with blackish; legs rather long and yellow.

**Caprimulgus Apaticus**, Asiatic goat-fucker, or Bombay goat-fucker of Latham. Plumage pale-ash, clouded with black and ferruginous; breast banded with cinereous; crown with a blackish streak, and a pale spot on the jaws and chin.

This species was first described by Dr. Latham, from a specimen in the possession of Sir Joseph Banks, in the Supplement to his Synopsis of Birds. It is, he says, the fize of the Virginia goat-fucker: length eight inches and a half. Bill dusky; general colour of the plumage not unlike that of the Siberian owl, being a beautiful mixture of pale ash colour, mottled with dusky down the middle of the crown; on each side of the under jaw is a pale streak; and on the throat a whitish spot; the breast crooked with numerous cinereous bars; between the legs pale rufous; the quills are dusky, barred with rufous; the first short; four of the greater quills have a spot of white on the inner web; the tail marked the same, but the two middle tail-feathers are likewise mottled, as the back; the outer ones on each side have the ends white for about an inch, but the white extends higher up on the outer webs; the middle toe is greatly pectinated. Inhabits Bombay. Latham.

It seems this bird has been also discovered in Africa by le Vaillant, who names it *Pensoulevent mufcien*, in compliment to its note, which he observes is both piercing and melodious, contrary to what has been advanced by an English writer (Dr. Latham), who affirms that its note is horrible. It has the same manners of life as the European goat-fucker.

**Caprimulgus Indicus**, Indian goat-fucker. Colour pale ash, transversely licated with black; cheeks, breast, and wings spotted with ferruginous; tail-feathers bluish, licated with black, the exterior one varied with ferruginous and black.

Latham describes this species, in his Supplement of Birds, as a native of India, on the authority of lady Impey, without mentioning its size. Another account is given of it by Vielot, a French naturalist, under the name of *Pensoulevent du Capri*, raye de noir, but which is a literal French translation of the following description. "Crowns and back whitish-sable colour, elegantly marked with minute dusky lines; cheeks, breast, wing-coverts, and secondaries beautifully marked in the same manner with lines and large spots of rufut; prime quills dusky; middle feathers of the tail light ash, crossed with a few black bars; outermost feathers rufous and black."

**Caprimulgus torquatus**, gold-collared goat-fucker. This is an inhabitant of Brazil, and is about the size of the common lark. The plumage is cinereous-brown, varied with whitish and dull yellowish spots; on the hind a golden ring; two middle tail-feathers longest.

Though the body of this bird is scarcely larger than a lark, its length of wings and tail is considerable. The upper mandible of the bill is hooked, and becet at the base with ten or twelve thick bristles; eyes black, head large, flat, and broad. The two middle tail-feathers are eight inches in length, but the rest are shorter; legs dusky, with black claws, the middle one of which is forked. This is called by Buffon Tenthèbre du Brésil; and *Le petit entellévent tacheté de Cayenne* by Vielot.

**Caprimulgus longipennis**, Lema goat-fucker of Shaw, Nat. Muf., a native of Sierra Leon. Size of a Martin. The plumage is grey, variegated; wings spotted with rufous and black; on each shoulder a long naked-shafted feather.

Vielot describes this curious bird under the title of *Pensoulevent de Léone*, after Dr. Latham, who very lately published an account of it, in which he names it *Caprimulgus macrourouspus*. The French author, Vielot, gives it as a new species, on the authority of Latham; from which we may presume he was either not aware of its having been previously described by Dr. Shaw, as above mentioned, or did not think proper to acknowledge the circumstance.

**Caprioles**, derived from capræolus, a diminutive of capra, goat, in Horsemanship, are leaps which a horse makes in one and the same place, without advancing forwards; and that in such manner that when he is in the air, at the height of his leap, he yeers or strikes out with his hind-legs as near and even together, and as far out as he can stretch them; in which action, he clacks, or makes a noise with them.

The capriole is the most violent of all the high-raised airs: there are several kinds of caprioles; as a right capriole, back capriole, side capriole, broken capriole, the open capriole, &c.

To make this air perfect, the horse should raise his fore parts and his hinder to an equal height; and when he strikes out behind, his croupe should be on a level with his withers. In rising, and in coming down, his head and mouth should be quite ready and firm; and he should present his fore head quite flat; when he rises, his fore-legs should be bent under him a good deal, and equally. When he strikes out with his hinder legs, he ought to do it nervously, and with all his force; and his two feet should be even, of an equal height, and their action the same: lazily, the horse should, at every leap, fall a foot and a half, or the space of two foot distant from the spot from which he rose. In order to make caprioles, it is not absolutely necessary that a horse should pass through cavorts and saltati; because some horses are naturally
rally more light and active in their loins than in their legs, and
which are brought to leap with more difficulty, than to the
other airs in which their strength must be much more united,
and their disposition attended to; but nevertheless it is cer-
tain, that if the horse is brought to rise by degrees, and is
worked in the intermediate airs, before he undertakes the
caprioles, he will not weaken and drain himself to much, and
will be sooner confirmed in his lefions, than one which begins
to at once with the caprioles. The motions of a horse, when
he makes a perfect capriole, have an effect directly opposite
to that of piafades and curvettes. These two airs are proper
to affaire the head of the horse, and to make it light, and
this by so much the more as the principal action depends
upon the haunches, and a moderate appuy of the mouth;
but caprioles are apt to give too great an appuy, because
of the horse, when he makes the strength of his air, that is,
when he strikes out as he is coming to the ground, is
toally supported by the hand; therefore, before he is
put to leap, he ought to have a perfect appuy, and his
shoulders should at least be raised and lightened, by having
made pèfades; and he should be without fear, anger, or any
kind of uncinelles, because, by leaping, he acquires a know-
ledge of his own strength and power, and he may apply it
to bad purposes, to free himself from obedience, and to in-
dulge his caprice and ill humour. Some horses have a dis-
position to this air, and sufficient strength to go through it;
but their mouths are so delicate, fragile, and averse
from the hand, that you cannot support them without
hindering them from advancing; hence it follows, that their
action before is cold and slow, and never sufficiently
high, and they cannot be carried forward when they raise
their croupe, and strike out; and it is impossible to keep them
firm as they come down. To remedy this, begin their
leisson upon the trot, and prefer them in it so slowly, as to
make them often go into the gallop; observe a medium, in
order to vary their strength and vigour, that they may fur-
nish as many leaps as are requisite to the perfection of the air.
Pursue the same course with a horse that is too strong, and
who retains and avails himself of the strength of his back, so
as not to make his leaps freely and readily; by this means
you will abate his superfluous vigour, which serves only to
disfigure and make him troublesome. It is often to fulfill a
horse that is light in the hand by means of the trot, before
you teach him to leap; but a contrary method must be ob-
served with those which are heavy and clumsy, or that pull
upon the hand. Gallop and trot them; and this exercise
will take away all fear of the aids and corrections, and the
following day they will present themselves more freely and
willingly. Instead of trying to correct the horse, which
pulls upon the hand, compel him to make some caprioles
with his face to the wall, and keep him up to it closer, or
farther off, as you find him heavy, or endeavouring to force
the hand; and by this method you will constrain him to
shorten his leaps, and to be more attentive to his buttocks.
If he abandons himself, or bears too hard upon the hand,
hold him firm at the end of his leap, and in the instant when
his feet are coming to the ground, yield your hand immedi-
ately to him, and he will abandon himself much less upon
the bit. If he retains himself, and hangs back, eating your
hand to him will not alone be sufficient; but to make him
advance, you must push him to his bit, by aiding him brisk-
ly, and in time, with your legs.

To dre the horse to the caprioles, the pillars may be em-
ployed, or they may be dispensed with. When the pillars
are employed, tie them to them, make him keep up to his bit pro-
perly, or what is called "fill up the cords," and endeavour,
by little and little, to make him rise before, taking care to
make him bend his knees, and gather up his legs, as much
as you possibly can. For this purpose, use your switch
briskly; for if you can teach him to bend his legs well, his
manage will be much more beautiful, and he will be much
lighter in the hand. When the fore part has been thus
gained, put him in the pillars again; shortening the cords,
in order to make him raise his croupe from the ground, and
yerk out equally, and, at the same time, with both his hinder
legs, which he must be taught to do, by attacking and
hooking him upon the croupe with the switch or chambriers.
When he is able to rise before and fall out behind, let him
be taught to unite these two times, and perform them to-
gether. Let him then be mounted, and always in the
pillars; and let the rider support him in the hand, and put
him to make one or two leaps, without leaning upon the
cords of the cavelon, in order that he may learn to take a just
appuy, and to feel it. As soon as he begins to know and
obey the hand, he should be aided gently with the calves of
the legs, should be supported, and you should "pinch" him
delicately and finely with both spurs. If he answers once
or twice to these aids, without losing his temper, or being
angry, you will have great reason to expect that he will
soon furnish his lepws equally and jolly, with respect to the
hand and heel. When he has been so far advanced by means
of the pillars, walk him straight forward a certain space; and
if he does not offer to rise of himself, try to make him. If
he himself takes the right time, seize the moment, avail
yourself of it, and let him make two, three, or four capri-
oles, or one or two, as you may judge it necessary. By
letting him thus walk calmly and quietly, in a short time he
will, of himself, begin to make caprioles straight forward; but
in case he should discover any signs of resistance to the hand
or heel, or the other aids, recourse should be had immedi-
ately to the cavelon and pillars. The method, now de-
dcribed, of adjutting and dressing a horse for caprioles, by
means of the pillars, is very dangerous in itself, and capable
of spoiling and making a horse become desperate and ungo-
vernable, unless it be practiced by persons of consummate skill
and experience.

Mr. Beringer prefers the following method, which, though
more difficult and painful to the horse, is better and more
sure. Having well exercised the horse in "pèfades," walk
him straight forward, keeping him "together," and support-
ing him so as to hold and tie him firmly; and, if need be, let
not go so as to flop him entirely. After this, strike him gently
with the end of the switch upon his croupe and buttecks,
and continue to do it till he lifts up his croupe and kicks.
Then care for him, and let him walk some pèfades, and then
attack him again, not minding to make him rise before, nor
hindering him from it, if he offers to do. Remember to
encourage and coax him every time that he answers to the
aids, and obeys. When he is thus acquainted with the aid
of the switch, let him make pèfades of a moderate height,
straight forward, and at the second or third, attack him behind
with your switch, to make him lath out. If he obeys, make
him rise "before" again in the minute that his hinder legs
come to the ground, in order to make him raise two or
three pèfades, to work his haunches. After this, coax and
care for him without letting him rise from the place, if his
appuy be firm and good; and in case it is hard, make him
go backwards, or if it is light and jolly, let him advance
quietly and slowly. To enable him to make his leaps jolly,
and to know the exact time of making them, no attention
should be given to the number of pèfades he makes before
or after his leap, but at the moment when you feel him pre-
pared, and which is in the pèfade, aid him briskly behind;
letting him, in the beginning, not rise to high "before,"
when
when you intend he should yerk out behind, as he would, were he only to make a pafade, that to his croupe may be more at liberty, and he may yerk out with more grace. In proportion as his croupe becomes light and active, you may raise his fore-part higher and higher, and support it while in the air, till he makes his leaps true, and in just proportion. When these lefions have been sufficiently practised, you may retrench by degrees the number of the pafades, which separated and divided the leaps. You may now demand of him two leaps together; and from thefe you may come, with patience and diftention, to three, or from three to four leaps; and, lastly, to as many as he can fuffer in the fame air and with equal strength. Remember always to make him trifle upon his launches; and this is the only fair way of preventing all the diforders horse may be guilty of from impatience and fear. Some horse will leap very high, and with great agility ftrait forwards, which, when put to leap upon the voltes, usually lofe their natural grace and beauty, for want of strength and not being equal to the lafit, in which all their motions are forced and conftrain'd. If a horse has a firm appree and strength fufficient to fupport this air upon the voltes, begin by making him know the space and roundness of the voltes to each hand; let him walk round it in a flow and diftinct pace, keeping his croupe very much prefied and confined upon the line of the voltes, which ought to be much larger for this air than for "croupades" and "balotades." When this is done, make him fieve, and let him make one or two croupes, followed by as many pe- fades; then walk him two or three steps upon the fame line; then raise him again, supporting him more and more, and keeping him even upon the line of the voltes, fo that it may be exactly round, and confining his croupe with your outward leg. If this lefion be given with judgment, your horse will soon make all the "voltes" in the fame air; and to make him fuffer a second, as soon as he has clofèd and finifhed the firft, raise him again, and without letting him fleep, get from him as many leaps as you can, working him always upon the voltes, in which he walks and leaps alternately, till he clofes and ends it with the fame vigour and resolution as he did the firft. Aid always with the outward rein, other upon the voltes, or when you leap ftrait forward, you will narrow and confine the fore-parts, and enlarge the hinder parts, by which means the croupe will not be preffed, but free and uncontrain'd. See Cures and Voltes. The refult way to fucceed, when you undertake to ftrain a horse to croupes, is to arm yourfelf with an invincible patience, and to prefer for this purpofe fuch horses as have a difposition, are active flight, and have a clear finely strength, to fuch as are endowed with greater strength and force; for their feet never leap regularly, and are fit for nothing but to break their riders' backs, and make them fpite blood, by their irregular, violent, and unexpected motions. Berenger's Hi.b. Art. of Horsemanhip, vol. ii. ch. 20.

CAPRONEZA, a small town of Hungary, in Selav- nia; 12 miles from the Save.

CAPRONE, in Geography, one of the Greek iflands N.W. of Samos, larger than Capra, and near it. See Cepha.
which have now acquired the solidity and firmness of a rock. The walls of the town were rebuilt by the inhabitants since their first demolition; but were afterwards destroyed by Jacob Almanzar, who went a governor and troops into the province. In Murum's time Capsa was very populous, abounding with many monasteries and other structures of superlative and regular workmanship; but it is now occupied by an indigent people, fleeced and oppressed by the Turco-Tatar government. It is built on a rising ground, and near it are plantations of olives, olives, pittachios, and other fruit trees, beyond which, occupying a small extent, is an interchange only of barren hills and valleys. The water which refreshes these plantations arises from two fountains; one within the citadel, the other in the centre of the city. The latter, supplied by Dr. Shaw to have been the "Jugus Aquae" of Sallust (Bell. Ingr. § 94), and the "Fairmaid of Elphis" (Geogr. Nub. p. 86) was formerly covered with a cupola. It is full walled round, and discharges itself into a large basin, formed originally for a bath. This fountain and the other before they leave the city, and form a pretty large brook, which, from the quantity of the water, and the rapidity of the stream, might continue its course to a great distance, were it not confinedly employed and inhabited in the uses above-mentioned. The climate and inhabitants of Capsa are unhealthy. Both men and women dress handsomely, except their feet, which they cover with coarse shoes of braving workmanship, and made of the rough skins of wild beasts, equally inconvenient and unworning.

The authors of the Modern Universal History (vol. xiv. p. 281, 8vo.) say, that its most probable situation is in N. lat. 33° 15'; and E. long. 69° 3'; 30 leagues from Teufena.

Capsa, in Geography, a town of European Turkey, in Romania.

Capsarius, from caspa,atchel, in Antiquity, a servant who attended the Roman youth to school, carrying aatchel with their books in it, sometimes also called librarius.

Capsarius was also an attendant at the baths, who took charge of the vestments of those by whom they were frequented. The Caspari, it should seem, at least in the latter days of the empire, had an officer particularly placed over them for the summary administration of justice. Dig. lib. i. tit. 15. § 3. Adverius capbarios quoque, qui mercer ferva in balneis veliftimina infcribatur. Judex coz. custodiscnti: ut fi quid in fervandis vestimentis fraudulentem, ipse cognoscat.

Capsarius, from caps, chast, among the Roman Rankers, was he who had the care of the money chest. or coffer.

Capschak, or Kispechak, in Geography, a considerable country of Tartary, which extends to Europe and Asia, between the Jieck and the Nieper. It is the country from which the Cossacks sprang. It abounds in grain and cattle; it is subject to a khan and several other princes. The people are warriors. Its capital is Stari.

Capsella, in Botany, a name given by Celsippinus to thalpia burra pafioris of Linnaeus, proposed by Juifieu, and received by Ventenat as a distinct genus, because it differs from the other species of thalpia, in having a triangular, or rather inversely heart-shaped, fiddle without a border.


Gen. Ch. Cal. perianth one leafed, five-leafed, or five-toothed, cere, permanent. Cer. monopetalous, wheel-shaped; tube very short; border five-leafed, spreading, plated; segments oblong, converging. Ff. germ egg-shaped; style thread-shaped, longer than the flowers; stigma obtuse. Peric. a dry berry, of different shapes, two or three-celled, hollow, coloured; receptacle adhering to the partition, dry. Seeds numerous, kidney-shaped, compressed.

Eff. Ch. Corolla wheel-shaped. Barry dry. Seeds compressed. Neatly allied to folium, but differs from it in having a dry, not pulpous pericarp, in the pungent, burning taste of its seeds; and in its general habit, which is so much alike in all the species, that it is not easy to give them decisive specific characters. The great variety that is found in the form and colour of the fruit increases the difficulty, and makes it almost impossible to determine, in many cases, which are the distinct species, and which are only varieties. Linnaeus, in his Species Plantarum, acknowledged only two species, one annual, the other shrubby, with a variety distinguished by its small, red, conical fruit. This variety he made a distinct species in his first Miseria and Systema Naturae, and added another with a somewhat shrubby, quadrangular stem. The old botanists mention many kinds. Miller has ten species, besides varieties; but several of his species are now effaced only varieties. Six of them are herbaceous and annual; at least, as he found by experience, they are such in our climate; their stems decaying soon after the fruit is ripe; but it may be doubted whether those that are in our native climates, may not become annual under our artificial treatment. In the enumeration of species, we shall take La Marek and Poiret for our guide.

Sp. 1. C. annuum, Linn. Sp. Pl. Gerat. tab. 132. fig. 2. Woodville Med. Bot. tab. 144. (Piper Indicum volatissimum, Bauh. Pin. 182. Valla-capo-Moago, Heed. Mal. ii. tab. 35.) "Stem herbaceous; peduncles solitary; fruit oblong." Root fibrons. Stem one to five feet high, nearly simple, round, a little frayed, smooth. Leaves egg-shaped, acuminate, entire, petiolar, placed in no regular order; petioles long, flexible, generally smooth, but sometimes, as well as the stem, a little pubescent. Flowers white, lateral; peduncles long. Fruit smooth and shining, very variable in its form and colour; in some inflames long, straight, acute; in others short, thick, obtuse, and even coniculate at its summit; in some red; in others yellow; and sometimes both colours on the same plant; in some, according to Miller, upright; in others pendant, which has induced us to omit the word pendant, inserted by La Marek in the specific character, although those plants in Miller's possession, which had upright fruit, may possibly belong to one of the following species. A native of the East and West Indies. 2. C. fruticosus, Linn. Sp. Pl. Lam. iii. tab. 110. fig. 2. (C. brasiliannum, Clus. Exot. 240. fig. 2. C. indicum, Rumph. Amb. tab. 38. fig. 5.) C. filica oliviformi, Tourn. Infl. 185.) "Stem shrubby; leaves lanceolate; fruit oblong; solitary, rather erect." Stem a little rough, rather nearly round, and like the other parts of the plants, a little pubescent; branches numerous, fluff, angular. Leaves alternate, or two together, or opposite to the young branches, lanceolate-egg-shaped, or acuminate, with yellowish nerves underneath, on short petioles. Flowers small, white, or yellow, placed a little above the axis of the leaves; peduncle long, almost straight, thread-shaped, thickened at the top when the fruit ripens, as in all the other species; calyx almost truncate, with five very short teeth; segments of the corolla almost lanceolate, acute, spreading. Fruit oblong, obtuse,
obtuse, the form and size of a small olive, reddish yellow.  A native of the Indies, and the Isle of Ceylon. 3. C. coriif-
forme, Lam. Illuf. Wild. (Piper filicuca parva, J. Bauh. ii. p. 544, Icon.) "Stem inclining to shrubby; fruit nearly glo-
ular, solitary, erect.  Nearly allied to the preceding.  Stem smooth, a little quadrangular, branched.  Leaves scat-
ttered, smooth, lanceolate, acuminate.  Flowers yellowish white, on long peduncles; calyx short, bell-shaped, trun-
cate, very lightly toothed.  Fruit about the size of a cherry, red or yellow.  A native of Brazil. 4. C. bacatum, bird-
pepper, Lam. Mant. (C. fruticosum, l. Sp. Pl.) C. fructu-
imino, Brown. Jam. 1776.  C. minus fruictum var. Sloane
Jam. 1780.  C. microcarpum, Lam. Mill. n. 105.  "Stem inclining to shrubby, even; peduncles often in pairs; fruit very small."  Stem striated, roundish, almost smooth; branches divaricated, zigzag.  Leaves alternate, peti- 
oled, almost heart-shaped, acuminate, tender, smooth, 
erved beneath.  Flowers often in pairs, very small, yellow-
ish white; peduncles unequal, united at their base, frigate, 
ubcent, calyx short, nearly smooth, with five awl-shaped 
teeth; segments of the corolla short, obtuse.  Fruit glo-
bular, a little oval, scarcely larger than a pea, smooth, red 
or yellowish; peduncle flat; Miller's minimum has leaves a little rounded at their summit, not acuminate.  A 
native of the Indies. 5. C. fruticosum, Lam. Mant. (C. fruc-
tulum longo, per fumum tragoenon, Tour. Inf. p. 152. C. te-
ragonum, Mill. n. 57) "Stem inclining to shrubby; fruit 
erect, thickened, somewhat heart-shaped."  Stem fairly pubes-
cent, angular, compressed towards the summit.  Leaves 
tender, alternate, lanceolate-egg-shaped, acute, fearcely-long-
er than the petiole.  Flowers almost axillary, solitary; 
peduncles straight.  Fruit bright red, globular, sometimes a 
little angular, emarginate, nearly the size of an orange; 
peduncles a little curved.  A native of the Indies. 6. C. 
inclining to shrubby; peduncles either falcate or er in pairs; 
fruit conical, very small, pendulous."  Stem smooth, trafted; 
branches numerous, zigzag, divaricated, angular.  Leaves 
egg-shaped, rather large, sharply acuminate; petioles a little 
pubescent, flender.  Flowers yellowish white, either four or 
five together, or in pairs; peduncles an inch long, curved 
early the top; segments of the corolla obtuse.  Fruit small, 
egg-shaped, terminated by the permanent petiol, yellowish.  A 
native of China. 7. C. conicum, Lam. Illuf. (C. conoides, 
Mill.) "Stem inclining to shrubby; fruit egg-shaped-coni-
cal, erect."  Distinguished from some of the preceding 
chiefly by its fruit, which is about half an inch long, bright 
red, a little belllying at its base, narrowed at the summit into 
an obtuse cone, and generally flanding upright on a curved 
Ilfuif. "Stem inclining to shrubby, zigzag; little branches 
and petioles hairy; fruit egg-shaped, pendulous, three-cell-
led."  Stem nearly quadrangular, pubescent.  Leaves ten-
der, egg-shaped, acute, smooth.  Flowers small, white, 
foliar, or several together; divisions of the corolla short, 
acute.  Fruit yellow, oblong, of a moderate size.  Found 
in the East Indies by Sonnerat.  All the species of capsicum have the same general quali-
ties, which are tenible in every part of the plant.  The 
fruit is much used for culinary purposes in its native coun-
tries, and has long since been introduced into Europe as a 
popular ingredient in soups and high-seasoned dishes.  Its 
taste is extremely acrimonious, and leaves a durable frena-
tion of heat on the palate.  When taken in small quantities 
it is a grateful stimulant; but if used to excess, it has a 
painful effect, and seems to fet the mouth on fire.  In hot 
climes, where only it is indigenous, a liberal use of it is 
found to be salutary in lengthening the rosmach, affil-
gislation, and correcting that putrefactive colililation of the 
humours which those climates have a tendency to produce.  The 
fusser kinds of the fruit are most in request.  The 
fruit of capsicum baccatum in particular, gathered when 
ripe, dried in the sun, and then pounded and mixed with salt, 
is keptfloat in bottles, and known in the West Indies 
by the name of Cayenne pepper.  Pepper-pot, according to 
Miller, is an old name of the same species, or of any sort of it 
which he calls minimum.  For this purpose the ripe fruit is 
first dried in the sun, then put into an earthen or stone pot, 
with a layer of flour between each layer of fruit, and baked 
in an oven till it is perfectly dried.  It is then cleaned from 
the flour, and beaten or ground to fine powder.  To every 
bottle of this powder, a pound of wheaf flour is added, and 
the mixture made into small cakes with leaven; these are 
baked, cut into small pieces, and baked again till they are 
as hard as biscuit, then beaten into powder and sifted. 
The result is the well known Cayenne pepper.  Capsicum gro-
sum is most proper for pickling, the skin being more leath-
er and tender than in the other species.  The fruit should 
be gathered before it comes to its full size, should be cut down 
onto one side to get out the seeds, and soaked two or three 
days in salt and water.  After it is well drained, it should 
be covered with boiling vinegar, and closely stopped down 
for two months.  It should finally be boiled in vinegar 
to make it green, and will want no addition of spice.  It 
the ripe fruit of any of the species be thrown into the fire, it 
produces a noilome vapour which occasions vehement 
feezing and coughing, and sometimes vomiting.  The powder 
taken up the nose will cause violent and dangerous fits of sneezing. 
Cayenne pepper, though its powerful properties have been 
so long known, has but lately been introduced as a medicine. 
It is now used both externally and internally to promote ex-
citement, where the bodily organs are languid and torpid, 
and according to Dr. Woodville, as an aromatic of the most 
aerid and stimulating kind, may certainly be found efficacious 
in some paralytic and gouty cauces.  The French authors of 
Demonstrations de Botanique, flate it to be a powerful 
romachic, and affert that six grains in powder mixed with 
honey, taken every morning, is a true specie for hypochon- 
drial disorders, and those head-aches which proceed from 
a relaxed stomach.  It has been successfully exhibited in 
cynanche maligna, and in what Dr. Mackitrick calls ca-
bexia Africana, which he considers as the most frequent 
and fatal predisposition to disease among negroes.  The 
dope de direct is from fix to eight grains.  Bergius gave 
the feeds of capucism with great luccces in inveterate inter-
mittents.

The annual capucism, which is the most hardy, is culti-
vated in Spain, Portugal, and the south of France, in the 
open air, for the sake of its fruit, which, particularly in 
Languedoc and Provence, is eaten green by the peasants at 
their breakfast, and preferred to onions or garlic.  In that 
state it is also pickled and used instead of capers.  The 
ripe fruit is employed in various articles of cookery.  In Eng-
land the different species are cultivated chiefly for ornamental, 
and their beauty depends in a great degree on the various 
and brilliant colours of the ripe fruit, which, intermixed with 
the green leaves and white flowers, all flourishing at the same 
time, makes a pleasing appearance in the garden, or the 
borders of the flower garden.  The harder annual 
species or varieties are propagated by seeds, which must be 
planted upon a hot-bed in the spring, and when the plants have 
six leaves, they should be transplanted into another hot bed 
at the distance of four or five inches from each other, and 
in warm weather should be allowed a good deal of fresh air. 
Towards the end of May, they should be hardened by 
degrees to bear the open air, and in June may be transplanted 
into
into borders of rich earth. They will flower about the end of June, and will ripen their fruit in autumn. The perennial shrubby forts, after they have been brought forward in the hot-bed, as before directed for the annual ones, should be planted singly in pots filled with rich earth, and plunged into a very moderate hot-bed, under a deep frame, where they may have room to advance. In the day-time, in warm weather, they should have plenty of air, but must be covered with glases every night, and should be frequently watered. On the first approach of frost, they must be removed into the house, where they may have a temperate warmth. The fruit will continue in beauty most part of the winter.

CAPSIZE, to, in Naval Language, to upset, or turn over any thing.

CAP SQUARE, in Artillery, a strong plate, generally of iron, which goes over the trunnion hole in each cheek of a gun-carriage, and is there curved or bent upwards into an arc, sometimes of about 120°, but generally into a semicircular one nearly so as to form with the said hole, (that is sometimes let down into the cheek about two thirds of the diameter of the trunnion, but most commonly so as to have its centre about a quarter of an inch only below the upper surface of the cheek) a circle capable of receiving the same. It is fastened to the plate-plate by a hinge in the joint-bolt, by means of which, it is raised up or let down when wanted. The cap-squares, when fastened down by means of the eye-bolts, or fore locks and keys, keep the trunnions in their holes and the guns on their carriages. There are two of them on every gun-carriage, viz. one on each cheek.

CAPSTAN, a large maffy column shaped like a truncated cone, and paffing perpendicularly through the deck of a ship, and turned by levers, or bars, which paff through holes pierced in its upper extremity; serving, by means of a cable which winds round the barrel, to draw up burdens fastened to the end of the cable. By the capstan veifels are drawn ashore, and hoifed up to be refitted; anchors weighed, and fials hoifed, cargoes discharged or taken in, &c.

The word is alfo written capfion, capfion, and even capfow. It is formed from the French cabfian, which signifies the fame.

The power of the capitan is reducible to that of the axis in perifcope.

The common moveable captan is exhibited in Plate III. Mechanics, fig. 15. A is the shaft, into the top of which four hand-pikes, B, C, D, E, are put, for the men to turn by: this shaft paffes through a collar at G, and works in a hole in the piece H; at F the rope is paffed twice round the barrel, and to keep it from flipping when the barrel is turned, a man conftantly pulls at the end or part J: this machine is prevented from moving by flakes, K, K, driven into the ground. Sometimes, instead of using the common barrel, A, F, fig. 15, a double one, fig. 16, is used. A, B are the two barrels, the one A being smaller than the other; CC is the running rope, one end of which is fannened to the barrel B, and the other to the barrel A; in fuch a manner, that when the shaft is turned, by means of the bar, CD, one barrel will wind on the rope, and the other will wind it off; the middle of the rope goes round a pulley, D, which is hooked to the great rope E. When the machine is turned, so that the great barrel B winds on the rope C, and the little one A at the fame time winds it off, it is plain that the great one takes up more rope than the other can fupply, and it will therefore draw forwards the rope E; and if the two barrels are nearly of a size, the pulley D will advance very slowly, and with proportionally great power.

CAP This capitan might eafily be converted into a crane, or windlafs, for raising weights, merely by giving the compound barrel, AB, an horizontal position, and habilitating a winch instead of the bar, CD. See CRANE. Dr. Robi- fon ascribes the invention of this kind of capitan to a man miftaken but ingenious country tradefman. Encyclop. Brit. Suppl. art. Machinery, vol. xx. p. 107. It appears, how- ever, says Mr. Brewler, in his late edition of ‘Fergon’s Lectures on select Subjects,’ (vol. ii. p. 377.) to be the in- vention of the celebrated George Eckhardt, and likewife of Mr. Robert McKeon of Philadelphia, fon to the present governor of Pennsylvania.

Fig. 17 represents the capitan used at the London docks for handling the ships in and out of the entrance-locks. AB is a caif-iron shaft, the lower end B of which works in a hole or focket in the bottom of a well; at A it moves in a collar in a caif-iron plate fixed over the top of the well, and which acts as a cover thereto: by having these two centres at a confiderable distance from each other, the capitan works very freely. At the upper end of this shaft is a caif iron wheel, E, whose four fpoke are hollow to receive the hand-pikes by which it is turned; F is the conical barrel on which the rope is wound.

There are commonly two capitans in a ship of war; the main-capitan placed behind the main-mall, flanding on the frift deck, and reaching four or five feet above the forecastle: this is alfo called the double-capitan, because it has two drum-heads, and serves two decks for drawing of anchors; and because its force may be doubled by applying hands on each deck. It has bars, whelps, &c. for turning and flogging it. See Plate III. Mechanics, fig. 18. The other is the jejee-capitan, or little-capitan: this stands on the second deck, between the main-mall and the mizen: its use is, chiefly, to have upon the jejee-rope, or to have upon the vol, to hold off by when the anchor is weighed; and on other occasions where a lefs force is required, than to weight the anchors, &c. See fig. 19.

The French call that an English capitan where there are only half-bars used: and which, for that reafon, is only half perforated: this is thicker than the others.

There is also a flying capitan, which may be moved from place to place.

The parts of a capitan are, the foot d, which is the lowest part, the spindle f, the smallest part of which turns round in an iron locket, called the faucer, the whelps, b, a fort of brackets set into the body of the capitan clofe under the bars, and reaching downwards from the lower part of the drum-head to the deck; the barrel A, the main body of the whole; the drum-head c, which is a broad cylindrical piece of wood fixed above the barrel and whelps, in which are holes for the bars to be put into; the bars, which are small pieces of timber by which the men heave; the pins, as e, which are little bolfs of iron, thrust perpendicularly through the holes of the drum-head, and through a correpodent hole in the end of the bar, made to receive them when the bars are fixed; the paws, which are pieces of iron bolted to one end of the beams of the deck, close to the body of the capitan, but fo as that it have liberty to turn about every way; and againft them do the whelps of the capitan bear; fo as that by them the capitan may be flogged from turning back. There are also hanging paws, as g, s, fig. 18, which reach from the deck above to the drum-head im- mediately beneath it; and lastly, the twifter, which is a rope paffed horizontally through holes in the outer ends of the bars and drawn tight, defigned to keep the men steady whilst they work, and to afford room for a greater number to work at once.
An important improvement has lately been proposed to the capitan by capts. Hamilton of the royal navy, which is that of reducing the number of whelps from six to five, making the lower part more obtuse, and filling it up circular by the chocks, and also making the upper part more perpendicular in the sides, and open, the whelps being a portion of a circle.

Several improvements in the structure of the capitan were proposed to the Academy of Sciences at Paris, in consequence of the prize offered by the Academy from the year 1739 to 1741. Seven memoirs on this subject were published in the 5th volume of the prize pieces, forming a detail of 206 pages in 4to. The last improvement was suggested by Stephen-Charles de la Lande, formerly professor of mathematics in the military school. A report on this subject was made to the "Bureau de Confutation" in 1754. The method which he proposes for obviating the inconvenience to which the common capitan is subject, when different round of rope are called about the barrel, by means of a screw or spiral wheel round the capitan, is particularly described in the supplement to Montucla's "Histoire de Mathematiques," vol. iv. p. 585—588.

In fig. 20, are shewn Mr. Plucknett's patent additions to a capitan, which save the time and trouble of forging the melfinger, or rope, by which the cable is hanked in. A is a double circular inclined plane, cut in the deck under the capitan. B, C, D, are lifters of caplan, shown in fig. 21, having a broad flat head, a, and a square bar, b, with a wheel, c, in the bottom of it, which runs on the inclined plane, A, the square part, b, fig. 2, works through the pawl-wheel, E, fig. 20. When the capitan is turned, the lifters running on the inclined plane below, will move up and down; and when the rope has wound itself down to the bottom of the capitan, they will pull it up again, as shewn at B and C, fig. 20. These capitans are now in use in many ships of war, as well as merchant-men, and answer the purpose very well.

The terms belonging to the use of the capitan are, rig the capitan, i.e. fix the bars in their respective holes, thrusting in the pins in order to confine them; hoist the capitan, i.e. go round with it heaving on the bars; surge the capitan; and come up capitan, that is, slacken and let go the cable which you have by; in a like sense they also say, launch out the capitan; pass the capitan, or fix the paws to prevent it from receding during any interval or panic in heaving.

capstan-bars, the pieces of wood employed in heaving round the capitan.

capsula, or capsella, denotes a bag, pouch, or receptacle of divers kinds of things.

The word is a diminutive of the Latin capsula, literally signifying a little box, or cuse; particularly a bag, or fatchel, wherein boys carry their books, &c. to school.

capsula, in chemistry, is a cæthath vessel, in form of a pan; wherein things are frequently placed, that are to undergo very violent operations of the fire.

capsula gentle, in anatomy, is the anterior or right margin of the ileer omentum, (omentum minus the gastro-hepaticum) which contains several vesicles and nerves belonging to the liver and gall-bladder, connected and surrounded by cellular and adipose substance. For a further account of this part, see liver and peritoneum.

capsula communis of the vena portarum, is a covering of firm and compact cellular sub stance, surrounding the trunk of the vena portarum, and attending its ramifications throughout the liver, where it includes also the concomitant branches of the hepatic artery and ductus hepaticus. See liver.

capsula atrabilis, or renales, the glandular bodies which are situated above the kidneys, and which are also described under the names of glandula renales, or suprarenal, and renes succenturiatus. See kidney.

capsula, in botany, (capsula, Lat. a little box) according to Linnaeus is a hollow pericarp, or feed-veil, which opens spontaneously in a determinate manner, but differently in different plants, to afford a pallage for the ripened seeds. Gartner in his excellent work, "De Fructibus et Seminibus Plantarum," uses the term in a more extensive sense, and states that it is to be a dry conceptacle, either membranous, coriaceous, or woody, sometimes without valves, but much more oftenly opening by the means of valves, which differ from each other in number, situation, and figure. He divides it into four species; utricule, famara, follicle, and capsule in the flexilefse sense of the word. To pass over the evident want of logical precision in giving the same name to a whole, and to one of its parts in contradiction to the rest, the first two, not opening spontaneously, may be much more advantageously considered as distinct kinds of pericarp. See those words. The follicle of Gartner corresponds with that of Linnaeus in his Systema Naturae, and practical works. He had called it conceptacle in the Philosophia Botanica, and uniformly separates it from the capsule; but as it possesses all the characters expressed in his definition of a capsule, it would doubtless be more proper to treat it as a particular modification of that kind of feed-veil. See follicule.

capsules differ from each other with respect to their number, the confidence of their outward covering, their external form, their interval division, and their mode of dehiscence, or opening.

1. With respect to their number, they are either single, as in lycnthus, pappar, and the greatest number of plants; or more than one in the same simple flower; either completely separate from each other, as in paeonia, calthia, and sedum; or more or less united, towards the bottom, as in dicetamus, nearly in their whole length as in heliphylla, or fill more intimately as in those which are called coccaces, or grained. The last are described by Linnaeus and most other botanists as consisting of only one capsule; but since each of the cocc or grains has the same mode of dehiscence as occurs in paeonia, dicetamus, and others which are universally deemed polyclapular, it seems more consonant with nature to consider them as diltinct. Those of coccaces are generally paid by Gartner to separate spontaneously from each other in a flate of maturity. It must be acknowledged, however, that when the various capsules of this kind are compared together, they are found gradually to recede from the polyclapular character, till at length they are so closely united, that it is not easy to draw a precise line of distinction between them and those which are strictly one.

2. With respect to the confidence of their outward covering, they are membranous, as in ocallis; coriaceous, or resembling leather, as in acelus; fliehy, or succulent, as in postederea; or woody, as in bankia and cedrela.

3. With respect to their external form, by far the greater number of capsules are roundish, or egg-shaped; but they are sometimes globular, as in centunculus and buttoria; cyllindrical, as in diastitus; inverely heart-shaped, as in venoica; angular, as in cympanula; trigonoous, or three-sided, as in polemonium; folio fided, as in parnassia; five-sided, as in laium; three-furred, as in canna; three-lobed, as in cecus; and so forming gradually to the compound capsule, which
which is dillious, or two-grained, as in mercurialis; three-grained, as in euphorbia; five-grained, as in avena.

4. With respect to their internal division, they confist of one or more cells, (loculiamenta.) When there are two or more cells, the substance by which they are separated is called the delignification, or partition, and the central column, the columnella. See these words. Some of the cells frequently become absorbive as the fruit ripens, and sometimes entirely disappear. The only method of determining their natural number with certainty is, to make a transverse section of the germ at an earlier period of the flower.

5. With respect to their mode of dehiscence, or opening, they are one, two, three, four, five, or many-valved. A capsule is said to be one-valved when it does not separate into distinct parts. Capsules of this kind open in various ways.

1. With lateral holes; about the middle, as in mottled species of campanula; near the base, as in trachelium; and near the summit, as in papaver.

2. With a single longitudinal slit, or chink, (rima); extending but a little below the summit, as in lythrum; to the middle, as in colchicum; and from the top almost to the bottom, as in butomus, caltha, and many others. This slit is generally on the inner or concave side; but is found on the outer or convex one in magnolia, agleia, and a few more.

3. With a short transverse slit on the summit, as in oldenlandia and bodyssey. With an entire round hole at the summit, as in lathyrus and roella; or with three, as in antirrhinum orontium. With short teeth in ceratium; or with deeper divisions, but not so low as the middle (bifarium, &c. dehiscens), as in dianthus and agrostemma. If the divisions descend to the middle of the capsule, it is said to be semi-valved; and if still lower down, whether they reach the base or not, it is called by Linnaeus two or more-valved, according to their number; two-valved, as in cirsium; three-valved, as in cirsus and epilobium; four-valved, as in parasium; five-valved, as in drosera, &c. Gärtner calls every longitudinal division a valve, although it be only a minute tooth, which seems preferable to the arbitrary distinction made by Linnaeus, without any essential difference; but it would, as we conceive, be still better to give that name only to such as extend to the base of the capsule. They open either from the top, as in epilobium, and most other genera; or from the base, as in cirsium. Gärtner adds, that this difference is of no importance: but however inconsiderable it may appear in the eye of the physiologist, it ought by no means to be passed over in silence by the discriminative and arranging botanist.

Capsules are more than one-valved: 1. When they split longitudinally from the summit, or the base, into two or more divisions: 2. When they split longitudinally with more than one chink, leaving the summit and the base entire, as in oxalis, xeris, and many of the orchideae: 3. When they divide transversely into two segments, appearing as if they had been cut round, (circumciss) about the middle, as in angustata; near the summit, as in hylocamus; or a little above the base, as in trianthema.

Capsule of the crystalline lens, in Anatomy, a production of the membranes hyaloidae, which surround the crystalline humour, and remain in its situation. See Eye, Anatomy of.

Capsulate Plants, Capsulate plants, are such as have a tetrapetalous regular flower, consisting of four distinct petals in each flower, and which bear their seeds in short capsule: by which they are distinguished from the filguea, which have their seeds in long cacte, or pods.

Captain, in French, capitaine. This word, in its ordinary acceptation, signifies an officer who commands a company, whether it be a troop of cavalry or a company of infantry or artillery. This word had formerly a much more general meaning than it has at present. For it denoted the commander in chief of an army or body of troops. And in this sense we still make use of it when we say, that Anleen, Anbhal, Scipio, Caesar, Turenne, Condé, Marlborough, Eugene, &c. were great captains. It was the name first given to the chief, head, or commander of a troop, company, or any other body of men by land or sea.

A captain used to be a very considerable officer, and had the command of a thousand, sometimes of four thousand, and sometimes of a greater number of men.

From the time of Leon XII. to that of Henry TV., persons most distinguished for their conduct in the French armies were called captains.

In the legions of six thousand men each, that were instituted by Francis I., every captain commanded one thousand men, who were divided into ten centuries, commanded each by an officer who had not the name of captain, but that of centenier or centurion.

There have been infinities in France of officers commanding corps from four to six thousand men under the sole title of captain. But these large bodies to commanded were composed of strangers or foreigners, as Scots, Germans, Swiss, Italians, whom gentlemen of these nations brought into the service of the French kings, a practice that continued even under Louis XIV.

In the most remote times of the ancient French militia, the name of captain was not given to their officers except the generals. Those, who commanded under the dukes and counts were the viguers and the ecuensiers, during the first and second races of their kings.

But when their sovereigns, besides employing the troops of their vassals, gave commissions to certain seniores to raise companies of gens d'armes, these seigneurs took the title of captain in the sense annexed to it at present. In the business of war, this appellation indeed has always denoted a commandant or chief of troops or soldiers. In the old French romances that of chevalier, which comes from the word cheif or chief, is sometimes made use of. And captain comes from caput, which also signifies chief.

The rank of captain, in the ordinary acceptation of the word is between that of a major and that of a lieutenant. A captain commandant is he who commands in chief a company, or has the chief command of a company.

In every nation almost, and in every service, there are captains of different denominations by the addition of other words expressive of the functions or duties of those, on whom the compounded appellations are belloved.

We for instance make use of the compound term Captain General. By the constitution the king is captain general, or generalissimo of all the forces in his united kingdoms of Great Britain and Ireland and their dependencies. The term comprehends the first military rank, power, and authority in the realm. In 1750 his majesty was pleased to delegate this rank with the powers and authorities annexed to it to his royal highness the duke of York.

Captain Lieutenant. This compound term in our service denotes the commanding officer of the colonel's troop or company in every regiment, when the colonel is either absent or gives up the command of it to him. By an order in 1750 this officer takes rank as a full captain, and by a late regulation he succeeds to the first vacant troop or company, the price of a captain-lieutenant and of a company being now the same. The title of captain-lieutenant is still made use of in foreign countries.

A captain reformed is one, who on a reduction of the army
At the termination of a war and the re-establishment of peace,
looses his company but retains his rank and pay, whether he
be on duty or not.

A captain on half pay is one who loses his company on a
reduction of an army and retires on half pay, until seniority
or a call for his services, puts him again on duty and full
pay.

A captain en second, or second captain, is one, whose com-
pany has been broken up, and who is joined to another to
serve under the captain of it, during whose absence, through
sicknecf or otherwise, he commands.

The French, by annexing others to the word captain,
multiplied the compound denominations of this title to a
great degree. Of these the following are the principal:

Captain general.
Capitaite lieutenant.
Capitaine en second.
Capitaines des postes.
Capitaines réformé.
Capitains conducteur général d’artillerie.
Capitaines des guides.
Capitaines des charrois.
Capitaines général des charrois de l’artillerie.
Capitaines général des vivres.
Capitaines des ordres.
Capitaines des ouvriers.
Capitaine conducteur d’artillerie.
Capitaine de mines.
Capitaine en pied.
Capitaine en pied sur un vaisseau de guerre.
Capitaine de port.
Capitaine d’armes.
Capitaines des gardes du corps du roi.
Capitaines des cent gardes Suisses du roi.
Capitaine des gardes de la porte du roi.
Capitaines des gardes de la prévôté de l’hôtel du roi.
Capitaine des gendarmes de la garde du roi.
Capitaines des chevaux legers de la garde du roi.
Capitaines aux gardes Françaises.
Capitaines en second aux gardes Françaises.
Capitaines aux gardes Suisses.
Capitaines dans la gendarmerie de France.
Capitaines des gardes du corps du Moniteur frère du roi.
Capitaines des Suisses de la garde ordinaire du corps de
Moniteur frère du roi.
Capitaines des gardes du corps de Monseigneur le comte
d’Artois frère du roi.
Capitaines des Suisses de la garde ordinaire de Monseigneur
le comte d’Artois frère du roi.
Capitaines commandants d’infanterie Française.
Capitaines commandants des grenadiers.
Capitaines commandants de chasseurs.
Capitaines a la suite des régiments de l’infanterie.
Capitaines a la suite de l’infanterie.
Capitaines a la suite des places.
Capitaines dans le regiment Suisses.
Capitaines commandants dans les regiments Allemands.
Capitaines commandants dans les regiments Irlandais.
Capitaines commandants dans les regiments Italiens.
Capitaines commandants dans les regiments Corse.
Capitaines des grenadiers royaux.
Capitaines dans les regiments provinciaux d’artillerie.
Capitaines dans les regiments provinciaux d’état major.
Capitaines dans les bataillons d’état major.
Capitaines commandants dans la cavalerie.
Capitaines a la suite d’un regiment de cavalerie.
Capitaines a la suite de la cavalerie.

Capitaines de cavalerie a la suite des places.
Capitaines commandants de carabiniers.
Capitaines attachés au corps des carabiniers.
Capitaines commandants de chevaux legers.
Capitaines commandants de houffards.
Capitaines a la suite d’un régiment.
Capitaines commandants de dragons.
Capitaines de dragons a la suite d’un regiment.
Capitaines a la suite des dragons.
Capitaines de dragons a la suite des places.
Capitaines commandants de chasseurs a cheval.
Capitaines dans le corps du génie.
Capitaine commandant la compagnie des cadets gentils
hommes dans l’ecole militaire.

There are also captains of several different denominations
in their corps of artillery.

Since the revolution in France some of these denominations
have ceased, and some of them have been changed into
others. It is not therefore our intention to give a de-
scription of each of them. We will only take notice of
some of the principal ones, and then speak of the know-
ledge and qualifications which captains ought to pos-
sess.

The title of captain general, or capitaine général, is very
ancient in France, and conferred an almost unlimited com-
mand on the person who possessed it, in the district where
he commanded. But it never corresponded to that of gene-
ral-in-chief or extended to the whole French army, but in the
case of the duke of Savoy in 1635, in the time of Louis XIII.
This title was revived by cardinal Mazarin in 1676 in fa-
vor of the marquis of Cafllement and the marquis d’Ussel-
elles, but not with such extensive powers. For they were
under the orders of the marshal of France, and it only in
fact gave the command of all lieutenant generals. It was
also conferred on others, as Mefieurs de Crequi, d’Humieres,
de Bellefons, and de Gadagni. But it did not continue long in existence. The count de Télèf also had the title of
captain general in Italy in 1702.

In Spain the rank of a captain general corresponds with
that of a marshal of France, who has the command of an
army.

Capitaine conducteur general d’artillerie, or captain-con-
ductor general of artillery, is the person who commands all
the captain conductors of artillery. He has charge of the
equipages and takes care that they are properly arranged
and march according to the orders of the general officer
of artillery, which are transmitted to him by the com-
mandants of the equipages of artillery.

Capitaine general des charrois de l’artillerie, the captain
general of artillery-carrages, or the captain general of the
carriage of artillery. This person ought always to be a
man of much experience as well as of a naturally good
and correct understanding with a clear arrangement of ideas.
He has the command and direction of the whole carriage of
the artillery.

Capitaine des guides, or captain of the guides, is the
person charged with the assembling, shooing, forming and
furnishing of guides. He ought to understand different
languages, and particularly that of the country, in which
the army is carrying on its operations. He should be active,
vigilant, and intelligent, practised in interrogating the guides
he assembles, expert in discovering which of them are best ac-
quainted with such or such a district or tract of country,
in which of them he can place most confidence, and who
amongst them are fittest to be employed as spies. As the
army advances he distinguishes those that are found to be ufeless
and chooses others. He furnishes some of them on foot and
fome
CAPTAIN.

Some mounted, and for this purpose procures both provisions and forage with forage from places in the neighbourhood of the army.

He encamps near the general's quarters, and when the general moves on to one or reconnosse in the field, he accompanies him with the most intelligent of the guides.

Of the knowledge which it is necessary for captains to possess.

That an officer of this rank ought to be well acquainted with every thing necessary for the proper discharge of the duties incident to his command or situation either in peace or war, in garrison or in the field, is a position, too obvious to be disputed, and requires no proof.

A captain then ought to understand the languages most generally spoken in Europe, and particularly that of the country with which the nation he belongs to is most frequently at war.

He should be acquainted with geography in general, and more especially with that of the country or countries in which his nation is carrying on war. He should know the directions and extent of the principal hills and mountains in them, the courses of the principal rivers, their depth and fording places, how far they are navigable by small vessels, by row-boats, or by canoes, the situations of the principal roads, bridges, dikes, fortified places, &c. &c. in them.

He ought to be well versed in history, particularly that of his own country; and should not only be acquainted with the best and most faithful accounts or narratives of battles, both ancient and modern, but ought to examine attentively and minutely the circumstances mentioned as attending each of them, and contributing chiefly to its failure or success. Such a course of study and reflection will soon enable him to acquire a knowledge of military management, resources, and expedients, greatly beyond that which his own experience might ever afford him. When placed in an unusual or trying situation, he will find in it something familiar or unlike to what he had before read or thought of, which resemblance or difsimilitude will immediately suggest to him expedients, and means of extricating himself from difficulties. It is by such a judicious, careful, and attentive perusal of history that both the ablest generals and statesmen have been formed.

For no man's experience alone, without the aid of study and reflection, is sufficient to make a man eminent in any profession.

A captain ought to be well acquainted, not only with the tactics, the manœuvres, the rules, and military regulations in the service of his own country, but also with the different branches of the art of war; and to extend his ideas and knowledge beyond the parade or a review. Regulations, in time of peace, deliver general principles; but they do not point out the happy application of them; which on service depends on the judicious regulations of military maxims by circumstances. He ought to understand what sort of works are best adapted to any particular situation or position; their form and disposition; the manner of tracing or constructing them; the materials necessary for reveting them; the tools and utensils wanted for erecting them; and in short every branch of knowledge requisite for securing or fortifying any given position properly. He should likewise understand the method of increasing the strength of any post by means of inundations, mines, palisades, abatis, advanced works, lines of counter-approach, &c. &c. He should know well how to defend an open city, town or village, a house, a church, an old castle, a church-yard, a barn, a farm-house, a block-house, a parapet, or defile, a dike, a ravine, the pailleage of a river, a ford, a wood, &c.

A captain ought also to make himself well acquainted with the business and duty of an officer commanding an advanced guard, an outpost, a foraging party, and every other sort of detachment.

A captain should likewise understand mathematics to at least a certain extent or degree. He should know the use of mathematical instruments and possess a sufficient knowledge of geometry for surveying and the measurement of heights and distances. He ought also to understand algebra, as far, at least, as quadratic equations.

A captain should also know how to sketch ground expeditiously, and to represent properly on paper the relative situations of hills, rising grounds, towns, villages, ravines, highways, and other roads, as well as the relative heights nearly of the different positions. But a knowledge that is merely confined to this, though it be necessary as an elementary part of instruction, is of but little value, and is calculated for rendering an officer vain and conceited, and for making him supposable that he knows every thing, whilst in reality he knows scarce anything that he ought to know. He should be able to determine precisely whether one position be preferable to another, either for the reception of troops, or for the purposes of defence. He should know how to combine artillery, houses, churches, church yards, dikes, fences, copes, woods, high-ways, &c. with field-works. He ought to understand the best methods of constructing such works, as well as the proper application of artillery to the attack and defence of field-positions. The doctrine of positions, and the combinations of attack and defence, form indeed the sublimest part of the art of war.

A captain, and indeed every other officer of engineers, ought to be thoroughly acquainted with fortification, the principles of construction both regular and irregular, of the attack and defence both of fortified places and field-positions, the theory of revetments and demi-revetments, the construction of batteries, &c. &c. independently of what they should know in common with other officers.

A captain, or other officer of artillery, exclusive of what he ought to know in common with the rest of the army, should be thoroughly acquainted with a variety of things peculiar to the service of his own corps. He should understand, as well as any engineer whatever, the construction of batteries; the situations and services to which different forts of ordnance are best adapted; in what circumstances it is better to make use of shells and hollow shot, than solid ones, and of howitzers and mortars, than cannon; the preparing and making up of ammunition; the charges best fitted to various services and situations; the practice of firing en richelet; the windage fit for different sorts and pieces of ordnance; the theory of projectiles both in vacuo and in the air; the construction of guns and gun-carrriages; &c. &c.

As to the physical qualities or qualifications of captains, they ought to possess good constitutions, and to be capable of enduring the continuance of fatigue, which is of the first consequence on actual service. Troops without these qualities, let their arms and drabs be ever so favourable for expedition, cannot make long and rapid marches, or perform their movements with celerity, which, ceteris paribus, will always ensure success to the army, that possess it in the greatest degree. He should also possess courage, or personal bravery, as well as coolness or steadiness in every situation. He ought likewise to enjoy distinct vision to prevent confusion and mistakes. For though Hannibal both fought and won some great and important battles after he lost the sight of one eye, every officer is not in point of talents, constancy, and abilities, an Hannibal.

As to his moral qualities, he ought to be honourable, just, temperate, free from drunkenness, gambling, and every
every other species of debauchery and dissipation, exempla-
ry in his conduct, conciliating in his manners, not given
to quarrelling, attentive to the comfort of his soldiers, obe-
cient and respectful to his superiors, mild and humane to-
wards his inferiors, a preserver of strict discipline, and at
the same time an enemy to severe and ignominious punish-
ments.

CAPTAI; BASHAW, signifies the Turkish high-admiral. See
Bashaw.

He possesses the third office in the empire, and is invested
with the same power at sea that the vizir has on shore.
Soliman II. instituted this office in favour of the famous
Barbarossa; with absolute authority over the officers of
marine and arsenal, whom he may punish, cashier, or put
to death, as soon as he is without the Dardanelles.

He commands in chief in all the maritime countries, cities,
cities, castles, &c. and at Constantinople is the first magistrate
of police in the villages on the side of the Porte, and the canal
of the Black Sea. The mask of his authority is a large
Indian cane, which he carries in his hand, both in the arsenal
and in the army.

The captain-bashaw enjoys two sorts of revenues; the one
fixed and the other casual. The first arises from a captation
of the islands of the Archipelago, and certain governments
in Nalolia and Gallipoli. The latter confis in the pay of
the men who die during the campaign; in the fifth of all
prizes made by the begrs, in the profits accruing from the
labour of the slaves, whom he hires as rowers to the grand
fiongion; and in the contribution he exacts in all places where
he passes.

CAPTAIN REZI, or CAPITAN REZI, an appellation given by
the Turks to the grand pilot, answering to pilot royal among
the French.

CAPTAIN, a title given to persons commanding ships of
war, carrying 20 guns or upwards. The commanders of
ships in the service of the East India company are also fyled
captains; and the same title has defended, very improperly,
to the masters of other vessels.

The charge of a captain in his majesty's navy is very com-
prehensive, inasmuch as he is not only answerable for any bad
conduct in the military government, navigation, and equip-
ment of the ship he commands, but also for any neglect of
duty, or ill management, in his inferior officers, whose several
charges he is appointed to superintend and regulate. On
his first receiving information of the condition and quality
of the ship he is appointed to command, he must attend her
constantly, and hasten the necessary preparations to fit her
for sea. So strict, indeed, are the injunctions laid on him by
the lord high admiral, or commissioners of the admiralty,
that he is forbid to lie out of his ship, from his arrival on
board till the day of his discharge, unless by particular leave
from the admiralty, or his commander in chief. He is en-
joined to shew a laudable example of honour and virtue to
the officers and men, and to discomfit all disolute, immoral,
and disorderly practices, and such as are contrary to the rules
discipline and subordination, as well as to correct those who are guilty of such offences as are punis-
able according to the usage of the sea. He is ordered par-
ticularly to survey all military stores which are sent on board,
and to return whatever is deemed unfit for service. His
diligence and application are required to procure his comple-
ment of men, observing carefully to enter only such as are
fit for the necessary duty, that the government may not be
put to improper expense. When his ship is fully manned, he is
expected to keep the established number of men complete,
and superintend the master himself; if there is no clerk of
the check at the port. When his ship is employed on a cruising
station, he is expected to keep the sea the whole length
of time previously appointed; but if he is compelled, by some
unexpected accident, to return to port sooner than the
limited time, he ought to be very cautious in the choice of
a good situation for anchoring, ordering the master, or other
careful officer, to sound and discover the depths of water and
dangers of the craft. Previous to any possibility of an
engagement with the enemy, he is to quarter the officers and
men to the necessary stations, according to their office and
abilities, and to exercise them in the management of the
artillery, that they may be more expert in the time of battle.

His station, during the time of an engagement, is on the
quarter-deck; at which time he is expected to take all op-
portunities of annoying his enemy, and improving every ad-

vantage over him, to exhibit an example of courage and for-
titude to his officers and crew, and to place his ship opposite
to his adversary, in such a situation, as that every cannon shall
do effectual execution. At the time of his arrival in port,
after his return from abroad, he is to assemble his officers,
draw up a detail of the observations that have been made
during the voyage, of the qualities of the ships, as to their
trim, ballast, flowage, manner of fURLsing, for the information
and direction of those who may succeed him in the command;
and this account is to be signed by himself and officers,
and to be returned to the resident commissioner of the navy at
the port where the ship is discharged, and to transact a du-
plicate of the same to the navy board.

The pay of captains in the royal navy was formerly very
small; this defect was, however, made up by indulging them
in many privileges not now allowed; as plundering of prizes,
taking convoy-monies, and even carrying merchant goods,
plate, &c. King James II. taking this last privilege away,
in heu thereof granted them an annual allowance of table-
monies, almost equal to their whole former pay. But this
not taking place, by reason of the abdication, king Wil-
liam III. in 1695 ordered the pay of captains to be doubled.
but the fund for this failing at the peace of Ryewick, a new
establishment was made in 1700, whereby nearly one-third
was retrenched from the sea-pay, and that of a line rate
was fixed at 11. of a second rate at 16s. and a third rate at
3s. 6d. of a fourth rate at 10s. of a fifth rate at 8s. and of a
sixth rate at 6s. per day.

Captains of prize ships, after three years from the date of
their first commission, rank as colonels in the army.
Admirals' ships, and those of the first rate, in the French
navy, have two captains, two lieutenants, and two en-
signs.

CAPTAIN, or more properly, master, of a merchant ship.
is the person who has the direction of the ship, crew, and
fading. &c. The proprietor of the vessel appoints the master, and
the master engages his mate, crew, and pilots, &c. though,
when the proprietor and master reside in or near the same
place, they generally act in concert together. In the Med-
iteranean the master is called the patron, or patron.

CAPTAIN, a title in the royal navy, given to those persons
who have the charge or command of a gun, of the tops,
&c.

CAPTAINS OF PORT, in the French Marine Affairs, officers
established in some considerable sea-ports where there are
 arsenals. To them belong the command of the guard of
the place, the watching of the sea, and the care and custody
of the vessels brought into port.

There are such captains at Toulon, Rochfort, Breiten,
Havre, Dunkirk, and Port Lewis. They are to take care of
mooring the king's ships, and oblige all to give the due
salutes.

CAPTAIN'S CLERK, a person employed by the captain to
keep
keep his accounts, &c. His pay is the same as that of a middling man. The captain is answerable for the faults of his clerk; nor can he receive his wages without proper certificates, and must make good all damages sustained by his neglect or irregularity. By a recent regulation, no person can be a purer unless he has served two years as captain's clerk.

CAPTAINRY, capitainerie, in the French Law, denotes the government or command of a royal palace, and the land dependent thereon. The name is also applied to the officer of captains of places or places; such are the capitaneys of Fontainebleau, the wood of Boulogne, &c.

CAPITAINS, in Geography, a town of France, in the department of the Gironde, and chief place of a canton in the district of Bazas; 3 leagues S. of Bazas. The place contains 3,015, inhabitants; the territory comprehends 364 square kilometres and 6 comunies.

CAPTIVE, in Law, is that part of a legal instrument, as a "commisson," "indictment," &c., which shews where, when, and by what authority, it is taken; found, or executed. Thus, when a commission is executed, the commissioners subscribe their names to a certificate, declaring when and where the commission was executed. The caption usually commences with these words, 

Viretur jussum commisssionem istam, &c. or, 

Exeito fius commissarum partem in quibus jubes annuvit, &c. or Capt. &cogn., &c. &c. or Capt. &cogn., &c. Capit. &cogn., &c. Captains of this kind relate chiefly to three sorts of business; to commit a man or to take fines of lands, to take answerers in chancery, and depositions of witnesses. These captions, and the executions of the commissions, must now be in English, by 1 Geo. II. cap. 26.

The word Captive, is also used, vulgarly, for an arrest.

CAPTIONS, in Scots Law, a writ issuing under his majesty's signet, in his majesty's name, obtained at the instance of a creditor in a civil debt, commanding messengers at arms, and other officers of the law, to apprehend and imprison the person of the debtor until he pay the debt. — Also, the name of a writ issued by the court of septon against the agents of the court, to return papers belonging to processes or lawsuits, or otherwise to go to prison.

CAPTIVE, a slave, or person taken by the enemy in war, or by a pirate or corsair. See Slave.

Captive, captivi, among the Romans, differed from dedicati, as the former were taken by force, whereas the latter surrendered themselves.

By the Lex Cornelia, a Roman citizen taken captive, in case he returned, was regarded as having never been taken; if he died in captivity, he was regarded as dead; he was taken in the former case he recovered all his rights, and even the dominion over his children; in the latter his son became free at the time of his father's detention. Justin, Inst. lib. i. tit. xii. § 5.

Formerly captives in war became the slaves of those who took them; and though flavry, such as obtained among the ancients, be now abolished, some shadow of it still subsists in respect of prisoners of war, who are regarded as the property of their captors, and have no right to liberty, but by concession from them, or till their ransom is paid. Negro servants likewise, who are purchased when captives, continue in some degree the property of the masters who buy them, though the property (if it indeed continues) confid.rather in the perpetual service than in the body or person of the captive. Blackl. Com. vol. ii. p. 409. See Negro and Slave.

The Romans used their captives with great severity; their necks were exposed to the soldiers to be trampled on, and their performances afterwards sold by public auction. Captives Vol. VI.

were frequently burnt in the funeral piles of the captive warriors, as a sacrifice to the infernal gods. See Burns. Those of royal or noble blood had their heads severed, and their hair sent to Rome, to serve as decorations in female toys, &c. They were led in triumph laden with chains through Rome, in the emperor's train, as far as the foot of the Capitolium mount, for they were not permitted to ascend the sacred hill, but carried them captive. Those of the prime quality were honoured with gold chains on their hands as well as feet, and golden cushions on their seats. If they made their escape, or fled themselves to avoid the ignominy of being led in triumph, their names or effigies were frequently carved on their places. "CAPTIVITY is used in &c. to denote the punishment inflicted by Providence on the Jews, for their idolatry and wickedness. Their full captivity in Egypt, from which they were rescued by Moses, should be considered rather as the result of providential intervention than as a penal evil. See Egypt.

The frequent captivities of the Jewish people may be regarded as chastisements of Providence for their lapses into idolatry, and as means of reclaiming them to the acknowledgment and worship of the true God. The scripture history informs us of six captivities, which took place during the government by Judges. The first was that under Channa-Rahathaim, king of Mesopotamia, and continued eight years, from the year B.C. 1291 to 1283, when they were delivered by Othniel, the son of Kenaz, Caleb's younger brother. The second was that under Elon, king of Moab, and lasted 18 years, v. 2, from the year B.C. 1232 to 1214. From this they were rescued by Ehud, and the eastern part of the country of Israel, after having been emancipated from the yoke of Moab, had rest 80 years. However, in the mean while, the Philistines invaded the western parts, and were recalled by Shunamm (Judg. iii. 31.) This is reckoned the third captivity. The fourth was that of the northern tribes by Jabin, king of Hazor, from which they were delivered by Deborah and Barak, in the year B.C. 1285; after which period the northern part of the territory of Israel had rest 40 years. (Judg. iv. 1, 2.) The fifth captivity, comprehending north and south Israel, was that under the Midianites, which lasted seven years, from the year B.C. 1245 to 1238; and from this the instrument of their deliverance was Gideon. (Judg. vi. 1.) Their sixth captivity was that under the Ammonites and Philistines. While Jair was judge over north and east Israel (B.C. 1175), those districts were in bondage to the Ammonites 18 years (Judg. x. 2); and at the same time with Jair, Eli began to judge south and west Israel 40 years, (1 Sam. iv. 18.), during which whole period that part of Israel was oppressed by the Philistines. (Judg. xii. 1.) In the first of these 40 years of Eli, which was also the first year of Jair, Samson was probably born; and he lived 40 years, judging west Israel (while Eli also was judge there, and while that part of the country was under the Philistines) 20 years. (Judg. xv. 20.) North and east Israel were delivered from the Ammonites, after an oppression of 22, or 23 complete years, in the year B.C. 1152. (Judg. x. 3.) The oppression of the Philistines continued during the judicatories of Ibzan, Elon, Abdon, Eli, Samson, and Samuel. Ibzan preceded over north and east Israel five or six complete years, from the year B.C. 1147 to 1140. (Judg. xi. 7.), when he was succeeded by Elon. About the fifth year of Elon (B.C. 1153), Samuel was publicly known to be a prophet. (1 Sam. iii. 11.) About the seventh year of Elon (B.C. 1143), Samson pulled down the temple (Judg. xv. 20.,) and destroyed a great number of the Philistines. Uther thinks that this calamity might encourage the
the faith and well Israelites to give them battle. (1 Sam. iv. 1.) Elon was succeeded in the judicature of north and east Israel by Abdon, B.C. 1130; and Abdon by Samuel, B.C. 1122, who was now judge over north and east Israel, as he had been before over south and west Israel. (1 Sam. viii. 15, 16, 17.)

However, the most signal captivities which these people experienced, were those of Israel and Judah, under the sovereignty of these kingdoms, after they were separated B.C. 975, denominated the Assyrian and Babylonian.

The Assyrian captivity, which comprehended that of the ten tribes, commenced in the reign of Pekah, king of Israel, B.C. 792, when Tiglath-Pilezer, king of Assyria, took several cities of Israel, and carried away captives, principally from the tribes of Reuben, Gad, and the half tribe of Manasseh. (1 Chron. vi. 26. 2 Kings, xv. 29.) In the fifth year of Hezekiah, king of Judah, and ninth year of Hoshea, king of Israel, B.C. 731, Shalmanezer, king of Assyria, took and destroyed Samaria, after a siege of three years, transplanted those of the ten tribes, that had been spared by his father, Tiglath-Pilezer, to Niniveh, and provinces beyond the Euphrates, and thus dispersed them among the Gentiles. (2 Kings, xviii. 10, 11.) Moreover, in the 22d year of Manasseh, king of Judah, B.C. 676, Eshahaddon or Assar-ducus, king of Assyria and Babylon, made the last deportation of the Israelites, and planted others in their stead; and in the same expedition, probably, took Manasseh captive, and carried him to Babylon. (2 Kings, xxv. 2. 2 Chron. xxxiii. 11. Ezra, iv. 2.)

The Assyrian captivity of the ten tribes of Israel, sometimes denominated Ephraim, from the chief of them, was predicted by Isaiah (see chap. vii. 8.) in the first year of Ahaz, king of Judah, B.C. 742. "Within three years and five years," says the prophet, "shall Ephraim be broken, that it be not a people." This period has very well puzzled the scripture critics. If this prophecy was delivered in the first year of Ahaz, and Shalmanezer took Samaria, and carried away Israel (Ephraim) into Assyria, in the fifth year of Hezekiah, we shall only have an interval of 24 or 25 years. For the solution of this difficulty, the learned Vigny supposes that the text is corrupted, and that instead of 66 (ע"ש"ע) and 5, it was originally written 26 (ע"ש"ע) and 5. This conjecture would appear much more probable, if it could be proved, that it had ever been usual to write the numbers or dates of years partly in words at length, and partly in numerical letters. But it is not necessary to recur to this expedient. For if we compute, from the first of Ahaz, 25 years in the reigns of Ahaz, Hezekiah, and Manasseh, they will terminate about the 2d year of Manasseh, when the captivity of the Israelites was completed by Eshahaddon.

It has been generally supposed, that the greater part of the ten tribes was lost in this captivity, which put a period to the kingdom of Israel. It is certain, that immediately upon their deportation, they were placed in Assyria and Media; and if they subfitted any where, it is natural to imagine, that they might be found there in the greatest number. But authors have generally sought for them elsewhere. Accordingly, the visionary writer of the second book of Esdras (xvi. 35, 36.) affirms, that they adopted a resolution of retiring from the Gentiles, and of emigrating into a country which had never been inhabited; that the Euphrates was miraculously divided for their passage; and that after pursuing their journey for a year and a half, they arrived at the country, Araxath; a country the situation of which has not been duly ascertained. See Araphians. Benjamin Tudela, a Jew of the 12th century, has assigned them a large and spacious country, with fine cities, in a situation that is altogether unknown. Eldad, another Jew of the 13th century, has placed them in Ethiopia, and hath made the Saracens and 25 kingdoms tributary to them. Another Jewish writer, Perilof of Ferrara, who lived in the 14th century, has allotted to them kingdoms in a country called Pericha, molested by unknown mountains, and bounded by Assyria, and likewise in the deserts of Arabia, and even in the South Indies. Manasseh, a modern of the 17th century, and others, have asserted, that they passed into Tartary, and expelled the Scythians; and other again from Tartary have conveyed them to America. Most of these accounts are unfounded conjectures, and some of them are manifest forgeries of the Jews to aggravate their own r"ation. However, some respectable modern writers imagine, that they have found existing traces of them in the northern parts of India, particularly among the Afghanians. The difficulty of ascertaining the habitations of the ten tribes, has induced others, among whom we may reckon Calmet, to maintain, that they returned into their own country, with the other two tribes, after the Babylonian captivity. To this purpose it is alleged, that their return was predicted. See Hoesa, xi. 11. Aqss, ix. 14. Obadiah, 18. 20. Iliam, xi. 13. 14. Ezekiel, xxxvii. 16. Jerem. xxxvi. 7, 8, 9, 10, 17. 20. xvi. 17. xlix. 2. &c. Zech. ix. 13. 6. 10. Micah, ii, 12. Besides, in the historical books of scripture, we cannot refer to the apocryphal book of Tobit, Israelites, as well as those of Judah and Benjamin, are reported to have returned from the captivity. When Ezra numbered those that were returned from the captivity, he only inquired whether they were of the race of Israel; and at the first pasover, then celebrated in the temple, there was a sacrifice of 12 he-goats for the whole house of Israel, according to the number of the tribes." Ezra, vi. 16. 17. viii. 35. Under the Maccabees, and in the time of our Saviour, Palestine was peopled with Israelites of all the tribes, without discrimination. However, as the decree of Cyrus extended to "all the people of God" (Ezra, i. 3.), and that of Artaxerxes to "all the people of Israel" (vii. 13.), there can be no doubt that many of the Israelites availed themselves of these decrees, and returned with Zechariah and Ezra to their own cities; nevertheless, the main body of the ten tribes remained behind. Accordingly, Ezra, upon whose authority we may depend, informs us, that there "rose up the chief of the fathers of Judah and Benjamin" (ch. i. 5.), and he calls the Samaritans "the adversaries of Judah and Benjamin" (ch. iv. 1.); and hence we may infer, that these two tribes were the principals, and that the others were only accessories. And if they did not return at this time, they cannot be supposed to have returned, at least in a considerable body, at any future time; for history informs us of no such adventure, nor do we know either the time or occasion of their return, or who were their conductors in this expedition. Josephus, who knew his country for several years in and about a condition as any time since the captivity, affirms (Antiq. lib. xii. cap. 5. § 2.), that Ezra sent a copy of the decree of Artaxerxes to all of the fame nation throughout Media, where the ten tribes lived in captivity, and many of them came with their effects to Babylon, desiring to return to Jerusalem; but the main body of the Israelites abode in that region; and therefore it hath happened, says this Jewish historian, that there are two tribes in Asia and Europe, living in feclusion to the Romans; but the ten tribes are beyond the Euphrates to this time; and he then adds, with the vanity of a Jew, speaking of his countrymen, that they were so many myriads, that they could not be numbered. Others, who have found no sufficient authority for admitting that the ten tribes of Israel were
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were restored in the same manner as the two tribes of Judah and Benjamin, have therefore affirmed (see Pusey's Comm. pt. 1. b. 1. 7) that the ten tribes of Israel, which had separated from the house of David, were brought to a full and utter destruction, and never after recovered their places again. But those who were thus carried away (excepting only some few, who, joining themselves to the Jews in the land of their captivity returned with them) were falling into the sages and idolaters of the nations among whom they were planted, to which, indeed, they were too much addicted while they remained in their own land, after a while became wholly absorbed in them; and thence utterly losing their name, their language, and their memorial, were never after any more mentioned. To this statement, however, it has been very justly objected, that if the whole race of Israel became thus extinct, we shall in vain expect the fulfilment of the numerous prophecies, that promise the future conversion and restoration of Israel as well as of Judah. The truth, says bishop Newton (Diflcerations on the Prophecies, apud Works, vol. vii. p. 195, &c. ed. 8vo.), seems to lie between these two opinions. "Neither did they all return to Jerusalem, neither did all who remained behind, comply with the idolatry of the Gentiles, among whom they lived. But whether they remained, or whether they returned, this prophecy of Hiasah (ch. vii. 8.) was fully fulfilled; the kingdom, the commonwealth, the land of Israel was utterly broken; they no longer maintained a separate religion; they joined themselves to the Jews from whom they had been unhappily divided; they left the name of Israel as a name of distinction, and were thenceforth in all common called Jews. It appears from the book of Esther, that there were great numbers of Jews in all the 127 provinces of the kingdom of Ahasuera, or Artaxerxes Longimanus, king of Persia, and they could not all be the remains of the two tribes of Judah and Benjamin, who had refused to return to Jerusalem with their brethren; they must, many of them, have been the descendants of the ten tribes whom the kings of Assyria had carried away captive; but yet they are all spoken of as one and the same people, and all without distinction are denominated Jews." See also Acts, i. 9. ch. xxvi. 7. James, i. 1. Without doubt, several persons of all the ten tribes are now in being, though we cannot discern them from the other Jews, with whom they are confounded and intermixed.

It appears, therefore, to be a fact, that the ten tribes of Israel were in a manner lost in their captivity, while the two tribes of Benjamin and Judah were restored and preferred several ages afterwards. Should an inquiry be made into the reason of this difference, it may be alleged, that the ten tribes had totally revolted from God to the worship of the golden calves in Dan and Bethel; and for this, and their other idolatry and wickedness, they were suffered to remain in the land of their captivity.

The Babylonish captivity comprehended that of the kingdom of Judah, or of the two tribes of Judah and Benjamin, who adhered to the house of David, and lasted 70 years. The mode of eliminating its duration has been attended with some difficulty, on account of the different captivities of the Jewish nation, which occurred about the same period. Of these there have been reckoned five. The first happened in the fourth year of Jehoiakim, B. C. 605, when Nebuchadnezzar, admitted to partnership with his father in the kingdom of Babylon, marched to Carcemiithim, with a great army, to recover from the king of Egypt all that he had lately conquered in Syria and Phcenicia. In the course of this expedition, he invaded and ravaged Judaea, besieged and took Jerusalem, made Jehoiakim his subject and tributary, transported the richest children of the royal family and of the nobility, and among the rest Daniel and his companions, to Babylon, to be bred up there for councils and laws in his palace, and also carried away the vessels of the house of the Lord, and put them in the temple of his god at Babylon. (Dan. i. 1. 6.) The second captivity happened in the fourth year of Jehoiakim, B. C. 602, when Nebuchadnezzar, immediately after his father's death, returned to Judaea, made captives of many Jews, and bound them king in order to carry him to Babylon; though he released him afterwards to his kingdom, having received the strongest assurances of subjection and allegiance. Notwithstanding these professions of obedience, Jehoiakim again rebelled, in the 11th year of his reign, B. C. 597. Nebuchadnezzar, hearing of this revolt, came against him with a prodigious army, and threatened all Judaea with destruction. Intimidated by this menace, Jehoiakim surrendered himself into the hands of his enemies, who slew him, together with many of the nobles, in Jerusalem, and placed his son upon the throne. (2 Chron. xxxvi. 6.) Afterwards repeating of what he had done, and fearing left Jehoiakim should embrace some future occasion of revenging his father's death, Nebuchadnezzar returned within three months, carried that unfortunate prince into captivity, and appointed Zedekiah to reign in his stead. (2 Chron. xxxvi. 9, 2 Kings. xxiv. 17. &c.) This may be reckoned the third captivity of the Jews by the king of Babylon. On this occasion Mordecai and Ezekiel were among the captives. (Esth. ii. 5, 6. Ezk. k. i, 2.) The fourth was in the 11th year of Zedekiah, 593 B. C., when the whole land was made desolate, when the city and temple of Jerusalem were destroyed, (the city being taken and burnt after a siege of 18 months, in the year B. C. 587, and the temple burnt in the year B. C. 586.) and when Zedekiah, king of Judah, was taken with letters of brazen, and carried prisoner to Babylon, where he died. (2 Kings. xxxiv. 3, 9. 2 Chron. xxxvi. 16. Ezk. xli. 13.) The fifth captivity occurred in the 21st year of Nebuchadnezzar's reign, B. C. 584, when that monarch sent Nabuzadana, captain of his guard, to revenge the death of Gedaliah, governor of Judah. Nabuzadana desolated the land, and carried to Babylon the wretched remains of that miserable nation.

To each of these captivities the date of the period of 70 years has been referred. But the fact of them, in the fourth year of Jehoiakim, B. C. 606, seems to be the most accurate commencement of this period, and is the most agreeable to Scripture. The interval extending thence to the second year of Cyrus, B. C. 538, when the Jews were permitted to return to their own land, amounts to 70 years; for Cyrus conquered Babylon towards the close of the year, B. C. 538, so that the year following, viz. 537, was the first year of his reign, and 536 the second, and the 7th from the fourth year of Jehoiakim. The date of the Babylonish captivity may be ascertained, says Playfair, (Chronol. p. 45.) by the following facts. Nebuchadnezzar became master of Tyre in the 34th year of his reign, the 26th of Jehoiakim's captivity, and 573 B. C. (57 B. C. Blair) as we learn from the Tyrian annals. (Josiph. cont. App. l. 5. 21.) Cyrus took Babylon in the 14th year of Hiram, and 56th after it had been taken by Nebuchadnezzar, i. e. in the end of the year 538 B. C. In this inference, therefore, the Tyrian records confirm the sacred chronology.

The captivity and restoration of the two tribes were foretold; and moreover the precise time of both events was also prefixed and determined by the prophet Jeremiah, ch. xxv. 11. xxvi. 10. This prophecy was first delivered (Jer. xxv. 1.) in the fourth year of Jehoiakim; and this same year Nebuchadnezzar began to put it in execution. If the
commencement of the 70 years' captivity be fixed at the time when Jerusalem was burnt and destroyed, their conclusion will fall about the time when Damascus, the son of Hadad, p. 187, in three different times, and in three different manners, and therefore possibly all might have been intended, tho' the first was without doubt the principal object of the prophecy. The prophets Isaiah (xli. 28.) and Ezekiel (xxvii. 10, &c.) have previously given very lively pictures of the happy days that should succeed the captivity, which were actually realized; for the people returning to their own country, enjoyed the blessings of liberty and influence. The people were multiplied, their cities were inhabited, and their fields were cultivated. Whilst the 12 tribes were dispersed and lost, those of Benjamin and Judah, or the Jews, were restored, not so much for their own sakes, as for the sake of the promises made unto the fathers, the promise to Judah that the Messiah should spring from his tribe, and the promise made to David that the Messiah should be born of his family. It was therefore necessary for the tribe of Judah, and the families of that tribe, to be kept distinct until the coming of the Messiah. But since these ends have been fully answered, the tribes of Judah and Benjamin are as much confounded as any of the rest; all distinction of families and genealogies is lost among them, and the Jews themselves acknowledge as much, when they say, that when the Messiah shall come, it will be part of his office to restore their families, and let the stranger be a stranger.

The captivity, considered as a dispensation of providence, will appear to have been highly necessary and proper, if we reflect, that the lenity of God was manifest in bringing this terrible overthrow on the Jews so gradually, after a succession of judgments from Lev 30, and have preserved the family for the space of 22 years, during which should have been a warning to them, and by experience have convinced them, that the threatenings denounced by the prophets would certainly be executed:—that it was a just punishment of their sins, particularly of their idolatry:—that it was the most effectual means to produce their reformation, the great end proposed by divine wisdom; and indeed it had this effect, in a very considerable degree, for they never more fell into idolatry, but retain the greatest abhorrence of it even to this day:—that they had so far neglected the law of God, written by Moses, as the rule of their conduct in all affairs civil and religious, and the ground of their happiness, that at one time it was almost unknown and lost among them (2 Kings, xxvii. 8, 12:—) and this dispensation was also calculated to produce beneficial effects among the nations, whither they were carried into captivity. The Jews, notwithstanding their depravity in their own country, during the captivity of 70 years, must have been a burning and shining light, all over the countries of the east.

Besides the captivities already enumerated, there happened another considerable captivity and dispersion of the Jews in the time of Ptolemy, the son of Lagus, usually called Soter, about the year B.C. 310, who invaded Judea, besieged and took Jerusalem, and carried away 100,000 of the inhabitants captives into Egypt, planting them in Alexandria and adjacent places. Ptolemy, though at first he treated Jerusalem and Judea with great severity, considering afterwards the foundations on which they had perished in the fidelity they had sworn to their governors, on this and a variety of other occasions, and convinced that this quality rendered them worthy of his confidence, chose 30,000 of the most distinguished among them and of such as were most capable of serving him, and appointed them to guard the most important places in his dominion. Many of the Jews followed their captive brethren of their own accord, partly by the favour of the king, who gave them equal privileges with those of Alexandria, and partly by the fertility of the country. To this colony, from which sprang the Hellenists, became very considerable. The last captivity of the Jews was that which happened in consequence of the destruction of their city and temple under Titus about 40 years after our Saviour's ascension. See JERUSALEM.

CAPTIVITY, princes of the, are heads or chiefs of the Jewish nation, appointed for the administration of justice among them, during their captivity both in the east and west, since the destruction of their temple by the Romans. The prince of the captivity in the east, is said to have had the government of the Jews who dwelt in Babylon, Chaldeæ, Assyria, and Persia. The prince of the captivity in the west, had the direction of those who lived in Judea, Egypt, Italy, and other parts of the Roman empire. The Jews make a great difference between the patriarchs of Judea, and the princes of the captivity at Babylon. The latter were called "rabbans," and were supposed to have descended from David, in a direct line by the males; the former or patriarchs, called "rabbins," only descended from David by the females. The patriarch, who reigned in Judæa, made Tiberias the place of his customary abode, and affixed the title of "Rabbinoth," i.e. the head of the fathers or patriarchs. He prefixed in assemblies, decided in cases of conscience, levied taxes for defraying the charges of his visits, and dispatched subordinate officers through the provinces to execute his orders. As to the princes of the captivity of Babylon, or the east, their origin and succession are unknown, as it appears that they sprung up till about the end of the second century. While the temple subsisted, the eastern Jews, as well as western, continued subject to the high priest. The first of these princes is said to have been Huna, at the close of the second century; and from Huna to the perfection of the talmud, i.e. 400 years, they scarcely produced three. Calmet. See ZECHMALOTARCHA.

CAPTURE, a prize, or prey; particularly that of a ship taken at sea. Captures made at sea were formerly held to be the property of the captors after a possession of twenty-four hours; but the modern authorities require, that before the property can be changed, the goods must have been brought into port, and have continued a night in port, in a place of safe custody, so that all hope of recovering them was lost. Blackst. Com. vol. ii. p. 401. See Prize and PRIVATEER.

CAPTURE also denotes an arrest, or seizure of a criminal, debtor, &c. at land.

CAPTURE, de Détenteurs. There existed under the old government of France an order, by which every interdict of a province or commissary of war was authorized to pay 100 livres to any person or persons, who should apprehend or secure a debtor, and 500 livres for every man, that
could be proved to have enlisted a soldier away from either the regular army or the militia.

CAPUA, in Ancient Geography, a city of Italy, the metropolis of Campania, derives its name, according to Strabo, from caput, head. It was situated at some distance to the north of Naples, near the mountains; and it was the chief and most important city of Magna Graecia. According to Pline, it was one of the three most celebrated cities known to the ancients, which placed it next to Rome and Carthage.

"Altera d'eft omnis Carthago, atque altera Roma,
Nunc profana jaect, propriorque fepulta fepulchro."

It is laid to have been founded by the Tyrrhenians, who had extended their power into Magna Graecia, about 48 years before the foundation of Rome, or 900 years before the Christian era. When the Sabine made themselves masters of the country, Capua fell into their hands, and Livy feeks the etymology of its name in that of their chief, called "Capys." The alluring fertility of the adjacent country, and a lucrative commerce, poured, at an early period, immense wealth upon its inhabitants, so that it became one of the most extensive and magnificent cities in the world. Riches produced excessive luxury and iniquities, in both which respects, Capua is particularly noticed by ancient writers. The luxury of Capua is laid even to have surpassed that of Sardis itself. See Athen. Diopritosiph. l. xii. p. 528. ed. Caubon. By its influence it exasperated neighbouring nations, which, on account of its eminence, was not able to repel; and therefore it was reduced to the necessity of endangering its own safety by engaging the succour of needy auxiliaries. The Roman soldiers who were sent to the defence of Capua, were on the point of making it their prey; and the voice of the Roman people often loudly expressed their wish for a removal from the barren unwholesome banks of the Tiber, to the garden of Italy, near those of the Volturno. Jealous, and not without reason, of the ambition of Rome, or naturally incontinent, as Livy and some other writers suggest, the Capuans warmly espoused the quarrel of Carthage; and Hannibal, after the battle of Cannae, made Capua his winter-quarters. In this scene of luxury and dissipation, if we may credit Livy and some other historians, the rough and invincible soldiery of the Carthaginian general were metamorphosed by pleasure and indolence into soft minions, never afterwards fit to cope with the Romans in the field. Hence, it became a proverb, "Capuam Hannibali Cannas fulce!" i. e. Capua was to Hannibal what Canea had been to the Romans. The judicious Monteffini observes, that the Carthaginian army, enriched by so many victories, would have found a Capua wherever they had gone. The pernicious effects of idleness and luxury are unquestionable; but the frequent defeats which Hannibal afterwards gave to the Romans, the several towns which he reduced in the sight of the Roman armies, and the bravery with which he maintained himself in Italy for 13 years, after the winter spent at Capua, conturn us to ascribe some degree of rhetorical exaggeration to the accounts of the Roman historians. Indeed, Livy himself points out a cause of the declension of the Carthaginian power in Italy, which is very different from the delights and debaucheries of Capua. Hannibal, disappointed of promised succour by a domestic faction, and deserted by the Gauls and Italians, who were not natural allies of the Carthaginians, was under the necessity of withdrawing from the scene of contcnt, and of yielding to a superior force, which drove him from Italy. Liv. l. xxiii. c. 13 and 32. l. xxvi. Whether Capua brought on the ruin of Hannibal or not, Hannibal, without doubt, occasioned the ruin of Capua. After the departure of the

CARTHAGINIANS, Capua, which had been long invested, surrendered at discretion to the consuls Appius Claudius, and Q. Fulvius Flaccus, in the year of Rome 542. On this occasion, 30 senators were decrated and put to death; the nobles imprisoned for, and the citizens, sold and dispersed. Vibius, Hannibal's principal friend, escaped this ignominious fate by a voluntary death; for which the mob insisted upon throwing open the gates to the enemy, he afforded his fixed associates, and fell down with them to a simple banquet; after which, each of the guests swallowed a profound draught, and expired in full possession of their freedom. Although the buildings were left undamaged, Capua was consigned to the lodging place for the inhabitants of the adjoining plain, a warehouse for goods, and a granary for corn. However, in process of time, about 172 years after this event, Cesar sent thither colonies, and restored it to its ancient privileges. Ciceron appears to have been the patron of this new city, and to have had it charge the inspection of the sea-coast from Formiae, A. U. C. 104, B. C. 50. In this command of Capua he calls himself the "episcopus" of the Carthaginian coast, and he also mentions when proconsul of Cilicia, the "dioeceses" that were annexed to his government, and hence it is inferred, that these names, which were afterwards applied to it, in the Christian church to characters and powers ecclesiastical, were carried with them in their original use, the notion of a civil authority and jurisdiction. See Dioce. As Capua had been always the common secondary, or place of educating gladiators for the great men of Rome, Cesar had a famous school of them, at the time when Cicero had the command of it. This school he had maintained under the best masters for the occasions of his publick fiews in the city; and as they were very numerous, and well furnished with arms, there was reason to apprehend they would break out, and make some attempt in favour of their master, which might have been of dangerous consequence in the then existing circumstances of the republic; and, therefore, Pompey thought it necessary to take them out of their school, and distribute them among the principal inhabitants of the place, affigning two to each master of a family, by which he secured them from doing any mischief. Cic. ad Attic. 7. 14.

Tiberius, A. D. 26, dedicated in this place a temple to Jupiter, and in the reign of Nero, A. D. 57, the colonies of Capua, and also of Nocera, which were almost extinct, were revived and strengthened by a number of old foldiers, sent thither with the same privileges as the ancient inhabitants. When the cities of Campania were divided between Vitellius and Vespasian, Capua maintained its attachment to the former, and in consequence of this preference, the third legion was quartered there for the winter, and the most illustrious families were treated with ignominy. At length, Generiue the Vandals, in the times of the Vandals, was more cruel than the Roman conquerors had been; for he massacred the inhabitants, and burnt the town to the ground. Narres rebuilt it; but in 841 it was totally destroyed by an army of Saracens, and the inhabitants were driven into the mountains. Some time after the retreat of these savage invaders, the Lombards descended again into the plain, but apprehending their force not to be sufficient for the defence of a circuit so extended as the old city, they built a smaller one on the river Volturno, chusing for its site that of Castrinum, which had distinguished itself in the second Punic war by the resistance of its garrison against Hannibal, and calling it by the old name of Capua. Since the foundation of the new city, old Capua, distant from it about two miles, has remained in ruins, occupying a considerable extent of ground. Of these, the most worthy of notice is the amphitheatre, which, though
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in a degraded and defolate state, indicates its former grandeur. Two small villages now occupy part of the spacious inclosure of this city, which was the centre from whence the via Appia, via Latina, via Domitana, and others, branched off towards different provinces of Italy. Along the edges of these roads the ancients buried their dead in magnificent mausolea, some few of which are yet standing, and point out the direction of the highways. The "concechia," a vulgar name given to one of these monuments, from a supposed resemblance to a dilapid, is the hand-some, and 

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famous and noble, with columns placed upon a square tower.

In 854, Landulph formed at Capua an independent earldom, dismembered from the duchy of Benevento; and in the course of a few generations, it acquired the title of a principality. In the 11th century, the Normans of Apulia expelled the Lombard race of princes, and Richard their chief became prince of Capua. The grandsons of Tancred of Antequera drove out the descendants of Richard, and united this state to the rest of his possessions.

Capua is at present a neat little city of Naples, in the country of Lavora, frated at the foot of a mountain. the seat of an archbishop, founded in 968. It contains, beside the cathedral, one collegiate, 16 parish churches, and 12 convents. It may be considered as the key of the kingdom: for though far removed from the frontier, it is the only fortification that really covers the approach to Naples, from which it is distant about 15 miles. The streets are more open and airy than those of other towns in this kingdom, and the buildings better. Many of them are constructed with materials brought from the ancient city. N. lat. 41° 7'. E. long. 15° 3'.

CAPUCHIN. See Cow, and next article.

CAPUCHUNS, religious of the order of St. Francis, in its strictest observance. The Capuchins are thus called, from capuce, or capucun, a stuff cap, or cowl, wherewith they cover their heads; and which they added to the ordinary Franciscan habit. They are clothed with brown or grey; are always bare-footed; and never go in a coach, nor ever shave the head.

The Capuchins are a reform made from the order of Minorit, commonly called Cordeliers, sat on foot in the sixteenth century by Matthew de Bassi, a religious observant of the monastery of Montefiascone, who, being at Rome, said he was advertized several times from heaven, to procure the rule of St. Francis to the letter. Upon this he made application to pope Clement in 1525, who gave him permission to retire into a solitude; together with as many others as would embrace the strict observance; which some did accordingly. In 1528, they obtained the pope's bull. In 1530, the order was brought into complete form; Matthew was elected general, and the chapter made constitutions. In 1543, the right of preaching was taken from the Capuchins by the pope; but in 1545, it was restored to them again with honour. In 1578, there were seventeen general chapters in the order of Capuchins.

The Capuchins were at first restrained from spreading out of Italy; but Charles IX. of France, writing to pope Gregory XIII. to demand some Capuchins, that pope, by a bull, dated in 1575, took off the prohibition, and granted them leave to settle any where. The cardinal of Lorraine, built them a convent at Moudon, and Henry III. another at Paris, in the rue St. Honoré. F. Zach. de Boverio has written the annals of the Capuchins in Latin, in three volumes folio, from the year 1524 to 1634.

CAPUCHIN, in Zoology, the name of a particular species of pigeon, in shape and make much like the jacobine, or jack, but somewhat larger than that; its beak also is longer; and it has a tolerable hood of feathers on the back part of its head, but has no crest or crown down the shoulders as that species has. Its marks are the same with the jacobine, and it seems to be no other than a bastard breed between that and a common pigeon.

CAPUCIN MONKEY, in Zoology. See CAPUCINA SIMIA.

CAPUCIN POWDER, in the Materia Medica. See CEVILLA, SABIDILLA, and VERATRU.

CAPUCIATTI, in Entomology, a species of PHALARA, (Bombix), that inhabits Europe. The wings are dentated and serrate, with a dorsal reflected tuft.

CAPUCINA, in Zoology, a species of SIMIA, of the long-tailed, or sapunj tribe, called by Pennant the Capucin monkey. This kind is distinguished by having no beard, the tail hirsute, (and prehensile); hair and limbs black; haunches covered, or without calloritis. Simia imberbis nigra, cauda longa hirsuta, facie fuscata. Lin. There are three kinds of monkey, simia trepida, appella, and capucina, that are nearly allied to each other; some consider the two last as varieties of the same species; Schreber makes them distinct.

Gmelin describes this animal as being about the size of the domestic cat: the general colour brown, with the head, legs, and tail black; face sometimes black, sometimes flesh-coloured; tufts approximate; nose carinata near the eyes; a black retracile wrinkle just under the hair of the forehead; tail long, curved, and shaggy, with hair, which it carries spirally rolled up, and often coiled round the neck. In the Levanian Museum is a specimen of this animal agreeing with the description given of the species by Mr. Pennant and Dr. Shaw. The face is round, flat, and flesh-coloured; encircled with upright whitish hairs; the breast covered with long hairy yellowish white hairs; top of the head blackish; hair on the shoulders and upper part of the back lighter than on the lower part; tail as in the former species; toes with crooked claws instead of flat nails.

Simia capucina is said to be a native of South America. The animal smells musky, has a wailing voice, sometimes shrieks like the cica, or when irritated yelps like a whelp, and terrifies or repels its enemies by hideous howlings.

CAPUCINUS, in Conchology, the name by which Rumphius distinguishes conus monacha of Limnae.

CAPUCINUS, in Entomology, a species of BOSTRICHUS in the Fabrician family, (Derm denes, Linn. and Boffichius, Geogr.). The colour of this insect is black, with red abdomen and wing-cases; and retuse thorax. Inhabitants Europe.

Obi. Lepechin describes a variety of this insect with a black abdomen. This is found in Siberia.

CAPUCUSUS, the name given by Walsh to the Limnan butterfly, Papilio PHEICL. which fee.

CAPUL, in Geography. See CAPUL.

CAPURA, in Botany, Linn. Mant. 255. Schreb. 599. Wild. 68; Jaff. 176. Leaves and flowers of the genus... Cor. Cal. mon. Cor. monopetalous, tubular; tube cylindrical; border with five roundish divisions, the outer alternate ones narrower. Stam. Filaments scarcely any; anthers fix, oblong, within the tube; the alternate ones higher. Fig. Germ superior, triangularly roundish, truncate; style cylindrical, very short; stigma nearly globular. Peric. Berry
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La Maree thinks it has some affinity to the genus Dais. Eff. Ch. *Calyx; Bres.,* or *Bavor;* within the tube. *Stigma* nearly globular.

Sp. *C. purpurea;* a tree. Branches alternately in pairs at right angles with each other, purplish. Leaves deciduous, opposite, egg shaped, resembling thistle of biennia xylochilum, entire, rather acute, or very short petioles. Flowers in axillary clusters, purple, shorter than the leaves.

A native of the East Indies.

CAPURSO, in Geography, a town of Naples, in the county of Bari; 2 3/4 miles S.E. of Bari.

CAPUT. See Head.

CAPUT, in the University of Cambridge. See Cambridge.

CAPUT Bavarice, the head of the barony, in Ancient Customs, denotes the ancient or chief seat or castle of a nobleman, where he made his usual residence, and held court: sometimes also called *caput boronei,* or the head of the honour.

The caput baronice could not be settled in dower; nor could it be divided among the daughters in case there were no sons to inherit; but was to descend entire to the eldest daughter, *ceteris filiabus absque justitia.*

CAPUT Celci, in Anatomy, the commencement of the large intestine, which is also called the ceacum. See Intestine.

CAPUT Draconis, a denomination given by some to a fixed star of the first magnitude, in the head of the constellation Draco, called also by the Arabs *rofhab and elumab.* See Node.


CAPUT Gallinoginis, or Verumontanum, in Anatomy, a small projection of the profile or cone, projecting into the lower part of the urethra, where that canal penetrates the profile, and having on its surface the openings of the ducts, formed by the union of the vasa deferentia, and vesiculae seminales. See Generation, Organs of.

CAPUT Jjumii, a name given to Ah-Wednesday, as being the first day of the Lent-fall.

CAPUT Lupinum. An outlawed slave was anciently said to have *caput lupinum,* and might be knocked on the head like a wolf, because, having renounced all law, he was to be dealt with as in a state of nature, when every one that should find him might flay him; but now the wilful killing of such a one is murder, unless in the endeavour to apprehend him.

CAPUT Medusa, in Astronomy, a northern constellation included in that of Perseus.

CAPUT Medusa, in Botany, Morif. Hist. iii. p. 316. See Elymus Caput medusa. See also Euphorbia Caput medusa.

CAPUT Mortuum.— *Tete morte,* Fr. Todkenalge, Germ. This term is at present obsolete. It was used by the old chemists to express the refudia of distillation after all the volatile parts had been driven off by the action of heat. Those refudia were at first thrown away as of no value. Glauher was the first who particularly employed himself in their examination, and was rewarded for his pains by the discovery of the salt that bears his name, (fulphat of foda), in the caput mortuum remaining after the distillation of mutric acid from common salt and green vitriol; and of fulphat of potash in the refidue after the distillation of nitric acid from nitre and fulphat of iron.

CAPUT Pancreatis, in Anatomy, that portion of the pancreas, which is attached to the duodenum. See Pancreas.

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CAPUT Purpurium, surname head, a denomination given by the Romans to an order of battle more frequently called century.

CAPUT Purga, a barbarous term used by some physicians to denote medicines which cleanse the head, either in the way of exciting, more frequently called cardinals; or by chewing in the way of salivaition, called *opophagismatus.* See Ehrina and Stomata.

CAPUT Sertorii, in Anatomy, a species of *Amsoria,* the shell of which is oblong, flattened, and divided by one with a long perforated hook. Lion. Pm. Since.

Inhabits the seas of the Norway fenn, and is generally found adhering to the madrepora porifera. Shell white, longitudinally flattened. Upper valve prominent behind, declining at the anterior part, and marked with a groove in the middle; lower valve rounded, and retuse before.

CAPUTA, in Ancient Geography, a town of Armenia Minor. Ptolomy.

CAPUTIATI, or CAPUICATI, in Ecclesiastical History, a sect of fanatics, so called from a singular kind of cap that was the badge of their faction, which infolated the province of Burgundy, the diocese of Auxerre, and several other parts of France, towards the close of the 12th century, and excited much disturbance among the people. They wore upon their caps a leaden image of the Virgin Mary, and they publicly declared that it was their purpose to level all distinctions, to abrogate magistracy, to remove all subordination among mankind, and to reform that primitive liberty and natural equality that were the inestimable privileges of the first mortals. They were attacked with the force of arms by Hugo, bishop of Auxerre. Moths. Ecc. Hist. vol. iii. p. 128.

CAPUTUADE, in Geography, a port of Africa, in Byzacium, where the Roman fleet landed the troops that made war against Gellier; distant, according to Photinius, five days' journey from Cartaghe. Justinian, he adds, built a town in this place inclosed by strong walls.

CAPYAE, in Ancient Geography, a town of the Peloponnesus, in Arcadia, near Mantinea, according to Dion. Hal. and Strabo, who supposed it to have been built by Amasis.

CAPYBARA, or CAEBBARA, in Zoology, the American name of a species of Cavia, found in that part of the world, and called by English writers the *water cavy,* or *river cavy.* It is distinguished by having no tail, and the fore-feet threecornered, and palmated. See Cavia.

CAPVS, in Entomology, a species of *Sphinx,* (Zygaena) of a black colour, with the tip of the anterior pair white. Fabr.—Inhabits Surinam.

CAPPTIUM, in Ancient Geography, a town of Sicily. Ptolomy.

CAR. See Carr.

CAR, or KAR, signifies in the oriental languages a town; and of course enters into the composition of the names of several places.

CAR, or CAM LOUGH, in Geography, a small lake in the county of Armagh, Ireland, at the foot of Slieve Gullion mountain, from which a narrow and rapid stream flows for a course of about four miles, when its waters contribute to the supply of Newry canal. This lake, river, and a small village, all of the same name, are mentioned on account of the great business done on the banks of the stream. So elevated is the source of it, that there are a great number of feet of mills, all of which are overfour. So sudden, indeed, are the falls, that no head of water is required as a millpond for any of the works, the tail-race of the higher mill being the head of the next below, and so in succession until
it reaches the valley. In the space of within two miles, there are four extensive bleach-greens, three of which can finish 50,000 webs in a year; one very large boiling-mill, beside two other flour-mills; a flax-mill, and some other manufactories about to be established. These numerous works furnish an eminent instance of the superior spirit and industry of the people in this part of Ireland, who so eagerly seize every natural advantage for forwarding and increasing their trade. Cooke's Armagh.

CARA, in Botany, France, Gert. tab. 25. fig. 8. See DISCOCHEA australis.

Carabine, in Geography, a river of European Russia, which directs its course towards the Arctic Ocean, and forms the boundary between Asia and Europe, for the space of about 140 miles; the Carabian chain terminating so far from the sea of Cara-bol, or Kara-bol.

CARABA, or Carabie, in Botany, attains in Guiana the height of 40 feet, and consists of numerous branches, covered with long, narrow leaves of a green colour. Its numerous white blossoms are succeeded by nuts about the size of a large chestnut, the form of which is angular and flat; within the thin, brown, hropy shell is contained a white oleaginous kernel. From these kernels the Indians extract, by bruising, macerating, and boiling, a yellowish, bitter, butyric acid oil, with which they constantly grease and rub their naked skins; thus defending themselves from mosquitoes, softening their skins, and preserving them from taking cold by dews, rain, &c. Bancroft's Guiana, p. 81.

CARABAYA, or Carabaya, in Geography, a district or jurisdiction of South America, in the diocese of Cuzco, and vice-royalty of Buenos Ayres, commencing on leagues S.E. of Cuzco, and extending above 50 leagues. The greater part of it is cold; but the valleys are fertile, producing various sorts of fruits, grain, and pulse, and affording sufficient pasture for cattle of all kinds. This province has several gold mines, particularly that called Aporana, which is very rich and the metal 25 carats fine, and also silver mines, which produce vast quantities of that metal. The river which separates this province from the mountains of the wild Indians abounds so much in gold, that at certain times the Caziques send out a certain number of Indians in companies from the towns in their respective districts, to the banks of the river, where, by washing the sand in small wells dug for that purpose, they soon find sufficient quantity of gold to pay the royal tribute. This kind of service they call Chicama.

CARABE, or Karabe, denotes yellow amber.

CARABIA, in Ancient Geography, a town of Macedonia, placed by Ptolemay in Moongia.

CARABIN, or Carbine, in French Canon carabies, is a fire-arm about a tenth of an inch smaller in the bore than a musket, and about five inches shorter, having its barrel about three feet one inch long, and its whole length, including the fock, about four feet one inch. Carabines, or canons carabies, have the outside of their canons or barrels of the same figure and form with those of common muskets. But they are generally, or at least often riddled on the table, having longitudinal grooves sometimes straight, but much oftener circular or spiral, running the whole length of the bore. When grooved, they are generally fired with leaden bullets, that are rammed down along the grooves with iron rammers or ram-rods, which running, together with the force and velocity with which they are driven back along the same grooves by the inflamed powder, considerably alters their shape and figure. The common observation, however, that a ball so rammed down and fired from such a piece goes further than one of the metal that has windings, in consequence of its being long enough in the barrel for the complete inflammation of the charge of powder, is founded in mistake. The grooves, when they are made winding, give the ball a sort of rotatory motion round its axis in the direction of its flight, that prevents its deflection from the path of its projection.

CARABINEER, or Carabinier, in French Carabier, was a soldier chosen from among the bell and bell-expect shooters, who served sometimes on foot, but generally on horseback, and carried a carabine larger than the ordinary fuses, and commonly riddled. But, in the French service, the distinction itself is greater than the carabines. They immortalized themselves at the battle of Fontenay. Any deficiencies in it, either in men or officers, were filled up by the regiments of French cavalry, according to their seniority. As to the time of rating it, or its seniority of creation, it would have been the twelfth regiment in that service; but in consequence of some other regiments having the name of Royal, and therefore standing before them, it only occupied the twenty-second rank or place.

Formerly, all regiments of light armed horse were called carabines. But, since the establishment of hussars and chasseurs, they have lost that appellation. And now all the heavy foreign cavalry are denominated carabiniers.

CARABINS, otherwise called Argulity, were a species of hussars in the ancient French militia, and sometimes acted on foot. There were choien and resolute men. All the principal officers of the army used to have them as their guards. And they were often stationed at the outposts for the purpose of harassing the enemy, guarding narrow passes, &c. In action they generally engaged in front of the dragoons, or on the wings of the line. The term comes from the Arabian word Karib, which signifies generally a warlike instrument of any kind.


CARABUS, in Entomology, a genus of Coleopterous insects that have the antennae filiform; thorax somewhat heart-shaped, truncated behind, and with the wing-cases margined.—This is the essential character of the genus Carabus, but which is distinguished further by having fix feelers, each of which has the joint oblique, and truncated: the abdomen ovate; and the posterior thighs furnished with an appendage at the base. The mouth is also small, the lip, in some entire and truncated as in the true Fabrician carabi: dentated as in his fcarabaeus, or trifid, as in his mammora, all which belong to the Linnaean carabi, except a few of the Scarites that are Tenebrose of that author. The legs of the carabi are also long, the thighs compressed, shanks round and ciliated within, the anterior part sparse, and the tars of all the legs composed of five joints.

Olivier divides the Linnaean Carabii into a variety of new genera, as echinus, callophoe, galala, brachinus, anthiap, manicore, saraite, lefteve, and odacanth. An arrangement somewhat similar to this appears in the different systems.
CA R A B U S.

The proposition of Fabricius, but not the same, and further alterations will have been adopted by other French authors besides Olivier. We think the carabi may, notwithstanding, be extremely well distinguished by adhering much nearer to the example of Linnaeus; the mantiocers and scarites we should ourselves separate as distinct genera from the carabids, but it is impossible to conceive the necessity of rendering the Linnaean genus into so many parts as Oliver has to form so many new genera—improvement, and not innovation, should be the leading object of naturalists when they prefix to devote from the authority of their predecessors. That the Linnaean carabi, even if we abide by the Linnaean method, should be separated into distinct tribes, is sufficiently apparent to every entomologist; we only mean to maintain that by thus dividing them into tribes, they may with few exceptions be retained under one general title with more convenience, and more propriety, than under each a number of different genera as the French writers are inclined to make of them. Fabricius even feems aware of this, for although he forms new genera of part of the Linnaean carabi, his own genus carabus is divided into four distinct sections:—I. Thorace cunato. — II. Thorace politæ angustato. — III. Thorace rotundato-marginato proniato obtuso. Mr. Marsham, in his recently published work, Entomologia Britannica, has also shown that it is far better to subdivide the Linnaean carabi into sections than to constitute new genera; the species of carabus found in England, which are those that chiefly demanded his attention, he divides into six sections, in the following manner. 1. Thorace politæ augusto.—2. Thorace politæ truncato integro, elytris equali.—3. Thorace politæ truncato integro, elytris angulitori.—4. Thorace politæ truncato integro elytris anguli for, sub-dulcato, attenuato.—5. Thorace politæ rotundato.—6. Thorace remoto. Gmelin divides the carabus genus into only two parts, distinguishing the insects according to their size, majorites and minorites, in the last edition of the Linnaean Systema Naturae. Turton, in his translation of that work, entirely deviates from his author; he adopts the Fabrician subdivisions, and this is certainly an improvement, but it should have been mentioned as such. The following arrangement of the numerous species of this genus will be found to correspond as nearly with the Linnaean and Fabrician authorities as the latest observations and discoveries of authors will conveniently admit.

Many of the insects of this genus possess the same habits of life. They live in the earth, under rocks, or in decayed wood, and are for the most part unknown. In the larv or perfect state a number of the species are definite of wings, but they are remarkably active, and run swiftly. Some kinds avoiding the light appear only in the night time, while others range about in the middle of the day, and seem to be most vigorous when the sun shines intensely hot, at which time numbers of them may be seen running in pathways, and shady places. If these insects are closely pursued, they emit a strong, and highly fetid odour, and when caught immediately eject both from the mouth and vent, a dusky greenish, or in some species, a reddish liquor of an extremely acrid and caustic nature, the smell of which is similar, but rather more powerful than the odour it sends forth when pursed. This offensive humour seems to be a provision of nature designed to compensate for having denied these creatures wings to facilitate their retreat from other voracious insects that are furnished with wings, the smell being alone sufficiently repulsive, it is reported, in many species, to check their ferocious pursuers till they can retire to some place of safety. They can also, as we may know by experience when handling them, defend themselves extremely well by means of their jaws with which they can pinch forcibly, and no doubt inflict a severe wound on the generality of insects; one or two species of the winged kind of carabi, if not more, are able to terrify their antagonists by making a loud, and frequently repeated snapping noise, which has been compared to the explosion of a musket in miniature. The faculty is more completely exhibited in the little species which the French call Bombardier, Carabus cephalus of Linn. Fam. Succ., and of later entomologists. It has been ascribed by some lively writers, that "the insect poisons the extraordinary faculty of discharging from behind, on being purfed or irritated, a bluish, fetid, and penetrating vapour, accompanied by a very smart explosion." "And this operation (it is added) the insect has the power of repeating ten, twelve, or even twenty times in succession with equal violence, thus frequently sleeping by terrifying its pursuers." (Shaw, Zool.) Another historian of this prodigious musketeer infils that "the smoke emitted at the time of each explosion is so dense as to completely conceal the insect for the space of a few moments from its purfurers, during which interval the warlike creature, like an able warrior, may, and does frequently effect its retreat in good order under cover of the smoke occasioned by its own fire." The record of this last account excites a smile; we with that much of the last mentioned circumstances may not prove a geffy tale for the credit of those who have attested to it. This insect, it really appears on credible authority, is able to make a loud noise, either by means of the vent, or by rubbing its wing-cases violently together, and to repeat the noise at pleasure, or as its dangers may require; what has been further stated must be at least received with caution by those disposed even to listen attentively to reports so marvellous.

The ancients considered the carabi as poisoomous, and supposed that if their cattle happened to devour any of them, which might often happen when they were grazing, an inflammation of the intestines would ensue. The carabi formed also an article in their materia medica; both Hippocrates and Pliny speak of them, and attribute to them the fame properties as the cantharides.

The species of this genus are as follows.

Section III. Thorace heart-shaped.

CARABUS MAXILLÆS, of Linnaeus, is one of the largest species in this genus. It inhabits the Cape of Good Hope. Olivier describes the species from a specimen in the Bankian cabinet. This insect is aperous; black; mandibles expanded, and as long as the head; thorax produced behind, and bilobate. Obs. The antennae are black with the tips fuscous; head expanded, flat in front, with the shield rounded and entire; mandibles acute, or pointed at the tips and entire; shells glabrous, black, and very slightly dotted. Fabr. This must not be confounded with manticora maxillæna of Fabricius, which De Geer calls a carabus (C. tuberculatus).

CARABUS THORACICUS. Aperous, or without wings, black; thorax lengthened behind into two lobes; sides and margins of the shells villosus, white. Fabr. Thumb. Obs. This is much allied to the preceding insect, and inhabits the same country.

CARABUS CORIÆCUS, one of the Linnaean species. This is of the aperous or wingless kind; its colour black and opaque; shells connected with intricate subangular dots. Linn. An inhabitant of Europe, and called by Geoffroy Buprestis ater.

CARABUS GLABRATUS; aperous, entirely black, very smooth,
and glossy. Fabr. Obs. This is the Carabus glaberatus of Paykull, and Carabus cornescus of Herbst. Inhabits Germany and Sweden.

Carabus violaceus, of Linn. and Paykull, is a species nearly allied to the former. It is apterous, of a black colour, with smooth shells, the edges of which, and the margin of the thorax are violet.

Carabus purpurascens, is of the apterous kind, and a black colour, with striated shells; margins of the thorax and shells violet. Inhabits Germany. Fabr.

Carabus auratus, Carabus cornescus of Linnæus. This is apterous, of a black colour, with wing-cases and rough intricate dots. Paykull, Monogr. This is called by Geoffroy Buprestis micro-violacea. Inhabits woods in Europe. Mr. Marlham describes the Linnæan-carabus intricatus as an English species. Vide Ent. Brit.

Carabus calcaratus, of Scopoli. Carabus problematicus of Herbst. This insect bears a strong resemblance to C. purpurascens, but has the body flattened, and is in other respects distinct. It is of the apterous kind; colour black; thorax and wing-cases edged with azure; shells striated, and marked with a triple row of impressed dots.

Carabus carabus. Apterous; black; thorax and shells very smooth, and brassy-green. Inhabits South Carolina.

Described by Fabr. from the cabinet of Cayot d'Orce of France. It is of a large size with the head black, and brassy behind; thorax brassy, and with an impressed dorsal line; shells without spots; body and legs black. Fabr.

Carabus bipunctus. Apterous, black, thorax and wing-cases with smooth, with three streaks of oblong elevated dots. Size of the following species.


Carabus gemmatus. Apterous, black, shells striated with a triple series of double, or two lobed brassy dots. Fabr.

Carabus frigatus of De Geer. An European species.

Carabus concolor. Apterous, black, wing-cases striated, with a triple series of excavated dots. Fabr. This inhabits Germany. Size smaller than carabus bor
tenfis. The head is black, glossed with copper, and inma
culate; thorax black, thinly tinged with azure; excavated dots of the same colour as the shells, not brassy as in bor
tenfis, and the body black.

Carabus tenebrifis. A North American species of the apterous kind, and black colour; shells somewhat smooth, fuscous, with a triple series of excavated dots. Found in decayed beech trees in Europe, Helwig.

This resembles carabus bor
tenfis; the antennae are black with the first joint ferruginous; its head coppery, and mouth black; shells irregularly punctured; and body black.

Carabus arvenfis. Apterous, black, and coppery; shells striated with a triple series of hollow dots. Paykull, Monogr. Inhabits Europe, principally Germany. Probably the same as Carabus cornescus, Marsh. Ent. Brit.

Carabus brunneus. Apterous, black; shells very smooth, and punctured with a triple row of black dots. Inhabits Hungary, Smith. Obs. The body is entirely black, and the margins are not brimih, as in some analogous insects.

Carabus rufifis. An insect the size of C. bor
tenfis, found on the shores of Patagonia, and preferred in the Bank
fian cabinet. This is apterous; shells striated, greenish, with a triple series of brassy hollow dots, and retuse at the base. Fabr. Obs. The antennae of this insect are brown, but at the base black; the head greenish, with black mouth; thorax green, and impressed on each side at the base; shells with created frise; body black.

Carabus Madeira. Apterous, black, with the shells re
tuse at the base. Described by Fabricius from a specimen in the Bankfian cabinet found at Madeira. Much allied to the preceding; the antennae black with fuscous apex; shells slightly striated, and marked with a triple series of minute greenish impressed dots: legs black.

Carabus convescens. Apterous, convex, black, smooth, with the posterior part of the thorax emarginate. Paykull. A native of Germany.

Carabus auratus. Apterous; shells golden and furrowed; antennae and legs fuscous. Linn. Inhabits Europe.

Carabus splendidus. Apterous; above bronzed, and glossy, future of the shells coppery. Found in Jamaica. Bof. Obs. This is a large species. The head is marked with two furro-s, and brassy, its mouth and antennae black; shells very smooth; body black. Carabus splendidus of Gmelin.

Carabus naturalis. An insect resembling the foregoing, but inhabit the Terra del Fuego, decribed by Fabricius from a specimen in the Bankfian cabinet. This is of the apterous kind; shells striated, and greenish with golden future.

The antennae of this species are dark brown, ferruginous at the base; head green, mouth fuscous; thorax green, golden margin; shells slightly striated with a triple series of ferruginous dots; break greenish; legs ferruginous.

Carabus nitens. Apterous; shells rough, greenish, with longitudinal raised lines, golden margin, and black legs. Linn. Carabus aureus of Degeer.

Carabus aurontins. Nearly allied to the former; it is of the apterous kind, with rough greenish shells marked with three longitudinal raised lines, and fuscous thighs. Inhabits Germany.

Carabus mortiklifis. Apterous; thorax coppery; shells striated, coppery, with longitudinal elevated dots, and rugged furrors. Fabr.

Carabus rugosus. Apterous, black; shells with rugose frrors, and three rows of elevated dots between them. Described by Fabricius from the cabinet of Sehelledt as a native of Morocco; it is twice the size of carabus granulatus.

Carabus elatus. Apterous, blackish-brassy, with rows of coppery excavated dots between the frise. Linn. Inhabits Europe.

Carabus granulatus. Apterous, blackish; shells brassy, with rows of oblong raised dotted between the frise. Linn. &c. Inhabits Europe.

Carabus refraus. Apterous; shells smooth, and black, and wider than the thorax; head very narrow.

This is an European species, and has been described by authors under various names; Degeer calls it carabus coadu
maturus.
natus, Linnaeus tenebris rostratus, and Paykull as well as Fabricius carabus rostratus, and by Fabricius in his appendix cyclus rostratus.

Carabus attenuatus. Apterous, black, shells slightly glazed with coppery, with a triple series of elevated dots; thorax narrower; head very narrow. Panzer, &c. This inhabits Europe, particularly Germany; in the full work of Fabricius it flutters in the new genus cyclus under the specific name of attenuatus.

Carabus eleminatus. Apterous; thorax with reflected margin; shells violaceous; body black. Fabricius. This and the following species inhabit South America, and are described from the Hunterian museum.

Carabus unicolor. Apterous; thorax with reflected margin; body black, and shells flat-topped. Carabus attilivinus. Apterous, black; thorax somewhat heart-shaped, and narrow; head attenuated behind; shells grooved and furrowed. Fabr. An Indian species, in the Bankian cabinet.

Carabus luciphthalmus. Apterous, black; shell-friated; thorax with short impressed lines at the base. Linn. Inhabits Europe, and is found in England.

Carabus plumos. Winged, depressed, black, with slightly frilated wing-cases. Fabr. Ent. Syll. Carabus pinguis of Paykull, and carabus elphius of Faun. Ent. Obs. Mr. Marsham in his Ent. Brit. considers this insect the same as the foregoing; namely, carabus luciphthalmus of Linn. Fabricius tells us it is rather larger, and has the body entirely black, and without spots; thorax heart-shaped, smooth, and without the little impressed lines at the base as in the former insect.

Carabus fritialis. Winged; black; thorax at the base with an impressed dot; wing-cases frilated, and glabrous in the middle. Described by Fabricius from the Bankian cabinet. Inhabits the shores of Patagonia.

Carabus falsulapis. Winged, pale; head, and dorsal spot on the body black. Fabr. A native of Saxony.

Carabus arenarius. Winged, pale; with two black dorsal spots on the wing-cases. Inhabitants sandy shores of Wales. Described from the Bankian cabinet. Fabr.

Carabus lateralis. Winged, black; thorax and shells marginated with ferruginous. An European species, and inhabits woods. Daldorf.


Carabus picicornis. An Italian species of the winged kind, with the head, antennae, and legs rufous. Muf. Allioni.

Carabus flavicornis. Winged, black; margin of the thorax, with the antennae, and legs yellowish. Paykull. Inhabitats Saxony. Hybner.

Carabus fulvescens. Winged, black; thorax canaliculated; shells frilated and smooth; antennae and legs smooth. Inhabits the woods in Germany. Smidt.

Carabus fuscus. Winged; thorax grooved with two stripes on each side; antennae and thanks of the legs piceous, or pitchy. Linn. and Schaeffer. Found in European woods.

Carabus femoralis. Head and thorax brassy; wing-cases dull, and frilated; thighs rufous. Inhabitats Sierra Leon. Bankian cabinet.

Carabus terricola. Winged, black, and glossy; wing-cases with smooth flax; extremity of the antennae, and the legs rufous. Paykull, Monogr. Inhabitats Germany, and is found under stones. Fabr.

Carabus maculatus. Winged; thorax with an impressed black dot on each side at the base; thighs rufous. Paykull. Inhabitats England.

Carabus americanus. Winged, black; thorax, antennae, and legs ferruginous. A native of America.

Carabus jammi. Winged; thorax ferruginous; wing-cases azure. Fabr. Carabus bicolor of Olivier. Inhabitats Carolina. Obs. The antennae are yellow, black, with the first joint rufous; head advanced, cylindrical, and brown; body black, with ferruginous feet.

Carabus somani. Winged, entirely ferruginous, except the wing-cases, which are blue-black. Inhabitants America.

Carabus crepitans. Winged; head, thorax, and legs ferruginous; wing-cases black. Linn. Le boutpare a fete, coree et petits rouges et tete bleus. Geoff. This is the best-furnished of French writers mentioned in the introduction, which is said to profess the faculty of terrifying its enemies by repeated loud explosions and fetid vapours emitted from the vent, whence its name crepitans. "Terrefactus creptus in hollem pellere tentat." This singular species inhabits Europe. Mr. Marsham describes it as a native of this country. Ent. Brit. Fabricius speaks of a variety of this species about half the size, that occurs in Germany.

Carabus feloleta. Ferruginous; wing-cases azure; with the future at the base ferruginous. Fabr. Found abundant in France under stones. It is much smaller than C. crepitans; there is a rare variety of it in which the future is the same colour as the wing-cases.


Carabus amoeboides. Winged, bluish-black with frilated wing-cases, and a rufous spot on the posterior part. Fabr.

An inhabitant of the South American islands, and allied in appearance to the former. The head is brassy-green, and glossy. Antennae black, with the first joint rufous. Thorax heart-shaped, punctured, brassy-green with a small impressed line on each side at the base.

Carabus humberalis. Winged, black with frilated wing-cases; spot at the base, and the legs rufous. Inhabitants Italy. Allioni.

Carabus tribulus. Winged, brassy-green; wing-cases with two white spots; antennae and legs yellow. A native of Guinea. Iferc.


Carabus oblongipunctatus. Winged, black, with frilated wing-cases, and numerous impressed dorsal spots. Inhabitants Germany.

Carabus varicolor. Thorax somewhat cordate or heart-shaped; black; shells azure; base of the abdomen and legs rufous. Fabr. Inhabitants Austria.

Carabus assilirius. Ferruginous; shells frilated, and black, with a pale spot at the base. Inhabitants Austria. Fabr.

Carabus cinclus. Winged, fuscous; head and thorax brassy-green; margins of the wing-cases, and legs pale. Inhabitants Coromandel. Bankian cabinet.


Carabus nitidulus. Winged, black; margin of the wing-cases shining-brassy. Inhabitats Kamtschatka. Bankian cabinet. Obs. The head and thorax black, glazed with coppery; wing-cases frilated, the frax punctured alternately. Legs black.
CARABUS.

CARABUS Diom. Winged, black; wing-cases frilled; bimacule at the base, and the legs ferrugineous. Inhabits Saxony, Hymer, &c.

This is of the middle size; head smooth, black; antennæ ferrugineous. Thorax heart-shaped, and grooved; body black; legs ferrugineous.

CARABUS agilis. Winged, russet; wing-cases and abdomen black. Paykull. Inhabits Sweden. The crown of the head is black, and the wing-cases truncated.

CARABUS fusculus. Winged; thorax ferrugineous; wing-cases truncate, frilled, greenish; head flat, and black. Fabr.

Described as a native of South America from a specimen in the cabinet of Dr. Hunter. It is of the middle size; antennæ black, with fuscous tips; thorax elongated, heart-shaped, and slaty grooved; wing-cases shining; abdomen black with ferruginous vent; legs black, thighs russet at the base.

CARABUS aleus. Winged; thorax russet; wing-cases fuscous with three fuscous spots. Inhabits Italy. Bosc.

This is very much resembles a cincticeps. The body is of the middle size; elongated, and more depressed than usual in the carabus genus. The antennæ are ferrugineous, with the third joint longer, incurved, and thick at the end; head black and glossy, mouth ferrugineous; shells slightly frilled; legs fuscous.


CARABUS atricapsillus. Winged; thorax fuscous; wing-cases telfaceous, and obtuse; head black. Linn. Inhabits Europe. Considered by Fabricius and others as a variety only of Paykull’s carabus agilis. It varies frequently in having the margins of the shells black. This insect is found in England.

CARABUS 4-pustulatus. Winged; yellow, with fuscous wing-cases, each marked with two yellow spots. Fabr.

Inhabits Africa. Described from the Bankian cabinet. This is an insect of small size; its antennæ are fuscous; thorax heart-shaped, yellow with an impressed dorsal line; wing-cases slightly frilled and truncated.

CARABUS oblongus. Winged; black; thorax oblong; wing-cases frilled, fuscous, with yellow antennæ and legs. A native of Germany. Smidt. Off. This is a small insect, with a black shining head, and yellow feelers; thorax grooved, black, and shining; flirts on the wing-cases crenated; abdomen pitchy.

CARABUS rubens. Winged; thorax ferrugineous; wing-cases rounded, telfaceous, with the head fuscous. Inhabits Germany. Fabr. This very much resembles carabus atricapillus; the shells are frilled, and without spots; the head fuscous.

CARABUS Iogetatus. Apterous, black; shells with nine furrows, and ten white dots. Linn. Inhabits Africa. Called by Degeer carabus alboguttatus.

CARABUS 6-guttatus. Apterous, black; wing-cases smooth; with two grey spots. Inhabits India. Olivier, Donov. Inf. Ind. &c. This is of a large size; the shell is square, and entire: jaws advanced, blunt, and pointed; legs black.

CARABUS 4-guttatus. Apterous, black; thorax with two large pitchy tubercles, and a small grey spot on each side; wing-cases furrowed; with elevated carinated lines, and two remote grey spots. A native of Africa.

CARABUS 7-guttatus. Apterous, black; above brown; shells frilled with seven white dots. Fabr. Inhabits the Cape of Good Hope.

CARABUS tabidus. Apterous, black; wing-cases with russet furrows. Fabricius.

Described from the Bankian cabinet as a native of the Cape of Good Hope. Its size is about half that of carabus 4-guttatus; the front is grooved on each side; thorax with two raised dorsal lines on the back part; wing-cases rather pointed behind; body deep black.

CARABUS nigripennis. Apterous, fuscous; shells grooved, and black. Inhabits the Cape of Good Hope. Occ. &c.

CARABUS varioguttatus. Apterous; wing-cases flat and smooth, with white fuscous margin and spots on the disk. A native of the East Indies, described by Forskál. Off. The eyes are telfaceous; lateral margin of the thorax whitish; wing-cases with five white dots on the disk; body black.

CARABUS exclamationis. Apterous; margin of the thorax white; wing-cases with a white margin, line, and dot in the middle. Fabricius. From Barbary.

CARABUS triloculatus. Apterous, black; edges of the thorax white; wing-cases whitish, with black line anduture. Inhabits Germany. Described by Thunberg under the name of carabus lineatus.

CARABUS cephalatus. Apterous, black, very smooth, with convex thorax. Linn.

CARABUS circinellides. Apterous, and black; wing-cases ovate, flat, ferrugineous, and villous edged with white. Inhabits the Cape of Good Hope. Stock. Trans.

CARABUS leucicus. Apterous, black, depressed; thorax and shells very smooth. Inhabits Coromandel.


CARABUS tricuspisulatus. Winged; black; antennæ, and legs ferrugineous; shield tricuspidate. Inhabits Barbary. Mus. Desfontaines.

CARABUS calydonius. Winged; head with an obtuse projecting horn; mandibles horned.

Scarites calydonius. Roffi. This kind inhabits Italy. The head is large with a large obtuse compressed horn in front; mandibles with a strong recurved tooth; shells punctured in flurce.

CARABUS complanatus. Winged, yellowish, with two black bands on the wing-cases. Linn. Found in St. Domingo.

CARABUS binaculatus. Winged, black; head and wing-cases truncated; dots at the base, and band in the middle ferrugineous. Linn. Inhabits India. Donov. Inf. Ind. &c. The thorax is variable in this species. Being sometimes yellow; sometimes black; and not unfrequently spotted.

CARABUS triquintulatus. Winged, black; with two yellow spots on each wing-case, the posterior ones approximate; legs yellow.
CARABUS.

A native of Siam. Size of the last species, and which, as Fabricius intimates, may prove to be only a variety of it. The head is flat, smooth, and black, with the mouth telfaces; thorax flat, smooth, black and without spots; wing-cases fringed, black with two large yellow spots; the legs yellow, with a single tooth on the anterior tibia.

**C. porcatus.** Rubious with black wing-cases, and three red dots. Inhabit the East Indies. Fabr.

The head and thorax are rufous; wing-cases fringed, and black, the red spot at the tip lunate; abdomen rufous with black margin; legs rufous.

3d Section. Thorax square.

**C. alternans.** Apterous, black; shells sprinkled with irregular impressed dots. Inhabit the East Indies. Fabricus.

This insect resembles the next species; the antennae are black, cinctures at the tip; head large; eyes globular, prominent, and telfaceous; thorax black, and immaculate; shells deeply fringed, and interfolded with smaller ones, the longitudinal fringes alternately broader, and three breaks of oblong ruffled brassy dots; legs black. Inhabit South American islands.

**C. cerinus.** Apterous, black; shells with cinctured fringes, which are broader alternately, and marked with a triple series of elevated brassy dots retuse at the tip. Fabricus.

This insect resembles the next species; the antennae are black, cinctures at the tip; head large; eyes globular, prominent, and telfaceous; thorax black, and immaculate; shells deeply fringed, and interfolded with smaller ones, the longitudinal fringes alternately broader, and three breaks of oblong ruffled brassy dots; legs black. Inhabit South American islands.

**C. porcatus.** Apterous, black; shells fringed and granulated at the tip. Inhabit New Holland, and is described by Fabricius from a specimen in the Tankian cabinet. This is of a moderate size.

**C. reflexus.** Apterous, black; wing-cases fringed, with two yellow spots. Inhabit Holland. Obf. The head is black, and fringed on each side; thorax unequally punctured, and slightly reflexed at the edge; shells connected, with eight grooves; legs black.

**C. punctulatus.** Apterous, larvate, and black; thorax camouflaged; shells grooved, with two interrupted yellow bands. Inhabit Holland. Fabr.

**C. carabus.** Apterous, black; thorax margin; legs smooth. Inhabit France. Bosc.

**C. carabus.** Apterous, black; thorax margin; legs smooth. Inhabit France and Italy. Rohr.

**C. globosus.** Apterous, black, with convex thorax, and fringed shells. A native of Morocco. Schlett.

**C. fabr.** Apterous; shells very smooth, with a triple row of brassy dots. Inhabit Barby. Believed to be the carabus auripunctatus of Paykull.

**C. fabr.** Apterous; shells very smooth, with a triple row of brassy dots. Inhabit Barby. Believed to be the carabus auripunctatus of Paykull.

In size and appearance resembles carabus insidiosus; the antennae are black, with the last joint fringulate; wing-cases very finely reticulated.

**C. carabus.** Apterous, black, and thorax dotted; wing-cases with cinctured fringes; antennae and legs fringulose. A native of Morocco. Fabr. Obf. The antennae are nearly as long as the body, whence its specific name longicornis: the head is black, with fringulose feelers; thorax rounded at the sides, dotted, and black; wing-cases black, and without spots; thighs blackish.

**C. carabus.** Apterous, black, with fringulose antennae.

This insect inhabits Germany. Helwig.


**C. carabus.** Apterous; antennae short and brownish; thorax smooth, black, and immaculate; wing-cases nearly smooth; body black; thumbs of the legs spinous.

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C A R A B A S.

bus obtusus, but differs in having all the lower surface with the legs and antennæ ferruginous.

**Carabus hirtipes.** Winged, filly-black; head brassy and shining. Fabr. Obs. The head is brassy, with the mouth and antennæ black; wing-cases ferruginous; legs black.

**Carabus fulvus.** Winged, black; thorax variolous; wing-cases grooved, with a ferruginous spot in the middle. Found at the Cape of Good Hope. Fabr.

**Carabus hirtipes.** Winged, black; head with two rufous dots in front; antennæ yellow at the base. Inhabitants Germany. Dall. Dorf. The body of this species is entirely black; head smooth and glossy; thorax smooth; wing-cases ferruginous; legs variable from red to black.

**Carabus fulvus.** Winged, azure; mouth, thorax, and thighs rufous; wing-cases ferruginous, and truncated. Inhabitants Barbary. Fabr.


**Carabus ferruginus.** Winged; thorax roundish; wing-cases fusco, ferruginous, with anterior hyaline spots, and dots on the posterior half. A new species lately discovered in South Wales. Donov. Tour. 1807.

**Carabus clavicornis.** Winged, brassy-black, with ferruginous antennæ; antennæ at the base red. Linn. Carabus virens. Myller. Obs. This species varies in colour from brassy to brassy, coppery and green.

**Carabus lepidus.** Winged, brassy-green; thorax with two rufous dots on each side; wing-cases ferruginous. Fabr. Carabus lepidus. Linn. It is a native of Europe.

**Carabus fuscus.** Winged, black, with ferruginous wing-cases, and a large oblong spot behind; antennæ and legs rufous.

This kind inhabits South America, and resembles in size and appearance Carabus pilicornis. The head is black; rufous on the wing-cases ferruginous; body black.

**Carabus corniger.** Winged, coppery; base of the antennæ red. Linn. Inhabitants woods in Europe.

**Carabus carinatus.** Winged, brassy-green; antennæ and legs rufous. Found in Terra del Fuego. Bankian Cabinet.

This is of a small size; head brassy, and shining; mouth ferruginous, posterior part of the thorax with an impression on each side; wing-cases ferruginous, and subfusco at the tip.

**Carabus corniger.** Winged, brassy-black; antennæ and legs black. Linn. Very common in sandy places in Europe. Obs. This is carabus ovatus of Roffi, Helv. &c. and carabus affinis, Schrank.

**Carabus communis.** Winged, brassy antennæ at the base and the halves rufous. Marliani, Pauzer. Rather smaller than the former, and is found in similar situations. Pauzer speaks of a variety that has the legs entirely rufous instead of the halve only.

**Carabus ovatus.** Winged, black; shells ferruginous and smooth; antennæ and legs ferruginous. Fabricius. Inhabitants Saxony.

**Carabus rufipes.** Winged, black; shells ferruginous; antennæ and legs ferruginous. Linn. Inhabitants Europe. The species is sometimes found in England, in woods.

**Carabus abdominalis.** Winged, black; antennæ, and legs ferruginous. Inhabitants the Cape of Good Hope. Fabr.

**Carabus auratus.** Winged, azure; antennæ and legs rufous. Inhabitants Germany. Helv. Entirely resembles the Fabrician carabus auratus, except in being entirely black.

**Carabus atratus.** Winged, black; thorax ferruginous, and legs black. A native of Germany. Helv. This resembles the latter in size and aspect; the head is black; thorax ferruginous, with an impressed dorsal line, and two little impressed lines at the base; wing-cases black, with ferrugine, and cristate. Inhabitants Germany. Smidt.

**Carabus linearis.** Winged, ferruginous, with a small black line on the wing-cases. Described from the Bankian Cabinet. The species inhabits North America.

**Carabus ferruginus.** Winged, ferruginous, and entirely convex. Marli. Inhabitants England, and the rest of Europe.

**Carabus ferruginus.** Winged, ferruginous, with a broad black lunule; abdomen black. Fabr.

This is a native of Barbary. The head is dusky; shells ferruginous; legs ferruginous.

**Carabus atratus.** Winged; thorax dark; wing-cases black, with heads ferruginous; hands with a broad black lunule; abdomen black. Fabr.

This is a native of Barbary. The head is dusky; shells ferruginous; legs ferruginous.

**Carabus auratus.** Winged, black; antennæ and legs ferruginous. Marli. Inhabitants Europe. The species is sometimes found in England, in woods.

**Carabus rufipes.** Winged, black; antennæ and legs ferruginous. Fabricius. Inhabitants Hungary.

**Carabus auratus.** Winged, black; antennæ and legs ferruginous. Inhabitants Germany. Smidt.

**Carabus auratus.** Winged, green, margin of the wing-cases and the halve tesselaceous. Linn. Inhabitants woods in Europe.

**Carabus auratus.** Winged, green, margin of the wing-cases and the halve ferruginous. Linn. Inhabitants woods in Europe.

**Carabus auratus.** Winged, green, margin of the wing-cases and the halve ferruginous. Linn. Inhabitants woods in Europe.

**Carabus auratus.** Winged, green, margin of the wing-cases and the halve ferruginous. Linn. Inhabitants woods in Europe.

**Carabus auratus.** Winged, green, margin of the wing-cases and the halve ferruginous. Linn. Inhabitants woods in Europe.
CARABUS.

and wing-cases, with the legs pale. Described by Fabricius from the Hunterian Museum, and native of America. Obs. The antennae are black; pale at the base; head black, with ferruginous mouth; abdomen black; postauricular, with black legs.

**Carabus fuscest.** Winged, fuscest; wing-cases absolutely divided; antennae, margin of the thorax, and legs black. Inhabits Germany.

**Carabus nigricans.** Winged, black and glossy; thorax canaliculated; wing-cases frayed. A native of Europe.

**Carabus quadratus.** Winged; thorax rounded; black; wing-cases frayed with a pale stripe. Inhabits Senegal.

**Carabus melanocephalus.** Winged; thorax and legs ferruginous; head and wing-cases black. Linn. Paykull, &c.

This is the species of the *Drosophila rubra* of Panzer, and the *Drosophila nova* of Geoffr. Found in woods of Europe, and in England. The head is black; wing-cases deep black, and frayed; thorax red. Linn. *F. S. W.*

**Carabus cyanoccephalus.** Winged; thorax and legs ferruginous; head and wing-cases blue. Linn. Inhabits European woods, and is found in England. Denon. Brit. *Inf.*

**Carabus rufilabris.** Winged, black; antennae, month and legs rufous. Found in Germany. Smidt. Size of the preceding; body black and glossy; thorax slightly canaliculated; wing-cases frayed; mandibles of the mouth black.

**Carabus violaceus.** Winged, yellowish; head and thorax black; wing-casesfuscous and frayed. Inhabits Denmark.

This insect is of a small size. The mouth is black; antennae pale; thorax smooth, black, and without spots; body and legs yellowish.

**Carabus anethiifolius.** Winged, azure; head and thorax shining-brassy. Fabr.

Described as a native of Cayenne, from the cabinet of Von Rohr. The antennae are hairy, brown, with ferruginous base; wing-cases frayed; body azure.

**Carabus crus-major.** Winged; thorax orbiculate; wing-cases, black, with two rufous spots. Linn.—Thorax yellow, glabrous; wing-cases behind black, with two yellow spots. *Carabus crus-minor. Marth. Ent. Brit.*

This is the species of the head, tip of the wing-cases, and the abdomen black. Inhabits Germany. Smidt. Obs. This is of an oblong figure; the mouth and antennae are tesselate; thorax rounded, smooth, and without spots; wings frayed; body tesselate; with black abdomen; legs tesselate.

**Carabus apricus.** Black above, beneath ferrugineus; wing-cases with a crescent-like fringe. Paykull, Mon. Inhabits the sandy plains of Dalmatia. Supposed to be the *Carabus furcatus* of Geoffr. and G. de Gugier.

**Carabus lunatus.** Winged; thorax orbiculate and rufous; shells yellow, with three black spots. Fabr. *Carabus furcatus.* Schrank, Beyer. This insect is found in England.

**Carabus praefasciatus.** Winged, black; head and thorax brassy; wing-cases ferrugineus, with a large, common, black spot at the tip. Inhabits Europe. Fabr. *Carabus latidens.* Paykull.

**Carabus carphites.** Winged; thorax brassy-green; shells black, with a ferrugineus spot at the tip. Inhabits Italy. Dr. Allioni.

**Carabus furcatus.** Livid; wing-cases with a black abbreviated line in the middle, forked at the base.

This is of a small size, and inhabits America. The head is dusky, with a black spot between the eyes, and the wing-cases are frayed.

**Carabus fusco-vittatus.** Winged; thorax orbiculate, and rufous; shells truncated and red, with a black crost. Linn. *Carabus crus-major.* Marth. Ent. Brit. *Le chevalier noir* of Geoffr. and Buprestis cruciata of Panzer. This inhabits European woods, and is, as well as the preceding species, found in England, but rarely.

**Carabus vitatus.** Winged; thorax orbiculate, and rufous; wing-cases black, with a white stripe. Inhabits North America. Fabricius. Obs. The antennae of this are black; head rufous; scutel small, and of the same colour; wing-cases glabrous, with a longitudinal white stripe on a black ground; margin rufous; body ferrugineus with black legs.

**Carabus teneius.** Winged; thorax orbiculate and rufous; wing-cases black, with a pale lunule at the base.

The country of this insect, which Fabricius describes from the Hunterian Collection, is unknown. The head is black; mouth and antennae reddish; thorax margined, and without spots; wing-cases frayed, slightly truncated, black; abdomen black; legs pale.

**Carabus hemeroboloides.** Winged; thorax somewhat orbiculate; rufous; wing-cases black, and rufous at the tip.

**Carabus fuscus.** Winged; thorax orbiculate and rufous; wing-cases black, with a pale lunule at the base.

The country of this insect, which Fabricius describes from the Hunterian Collection, is unknown. The head is black; mouth and antennae reddish; thorax margined, and without spots; wing-cases frayed, slightly truncated, black; abdomen black; legs pale.

**Carabus hemeroboloides.** Winged; thorax somewhat orbiculate; rufous; wing-cases black, and rufous at the tip.
CARABUS.

Fabricius as an English infect. Carabus 4-guttatus of Paykull.

Carabus spinulosus. Winged; thorax black; wing-cases dusky, with two pale bands. Inhabits Europe. Carabus dentatus, Thunberg, and Elaphurus rugosiss, Fabr. Mant. &c.

Carabus doralis. Winged; thorax black; shells pale, with a large black dorsal spot. Fabr. Inhabits Germany.

Carabus biguttatus. Winged; thorax brassy; wing-cases black, with a pale spot at the tip. Inhabits woods of Norway.

Carabus guttula. Winged, deep black, with a white hylone spot on the posterior part of the wing-cases. A native of Germany. Smidt. Carabus riparius of Paykull.

Carabus tesselatus. Winged; head and thorax ferruginous; wing-cases tesselaceous. Linn. Found in Europe.

Carabus truncatus. Winged; thorax ferruginous; wing-cases fractured, abbreviated, and black. Inhabits Saxony. Hybenr.

Carabus bipunctatus. Winged, brassy; antennae and legs black; shells with two impreme dots. Linn. An European species.

Carabus abbreviatus. Winged; thorax rufous; wing-cases abbreviated and tesselaceous. Found among the rocks of Norway. Fabr.

Carabus color. Winged, brassy, and shining; legs ferruginous. Found among mosses in Europe. Fabr.

Carabus minutus. Winged, black; shells and legs piceous. Inhabits Germany, and lives in the trunks of trees. Smidt.

Obf. This, as the name implies, is a small species. The head is black; antennae piceous; thorax roundish, black, and without spots; wing-cases fractured; body black, and legs ferruginous.

Carabus pygmeus. Winged; above shining-brassy; beneath deep black. inhabits Germany. Smidt.

Carabus trifur. Winged, black, with rufous legs. Found in Germany. Smidt. Obf. Small; antennae entirely black; head and thorax glabrous and black; wing-cases fractured. Paykull speaks of a variety of this infect with piceous legs, which he says is found in Sweden.

Carabus truncatus. Winged; above dusky-brassy; beneath deep black; wing-cases obtuse. Linn. Inhabits France. Size small; antennae and legs deep black.

Carabus minus. Winged, deep black, with fratured shells. Inhabits Germany. Smidt. Obf. This is very small; head and thorax black, and without spots; antennae and legs black.

5th Section. Thorax various, or uncertain.

Carabus angulatus. Apterous, thorax angulated, brassy; shells greenish, for-purt fratured; tip and margin rugose. Marsh. Inhabit England.

Carabus gigas. Thorax truncated behind, and entire; ovate, convex, gibbous; wing-cases with created frize; legs and antennae piceous. Marsh. Taken near Colchester, by the late Mr. Curtis, on Rubi fruticiosa.

Carabus rugosus. Thorax truncated behind, and entire; black; wing-cases dusky; antennae and legs ferruginous; margin of the thorax rufous. Inhabits England. Marsh.


Carabus convexus. Black; wing-cases fratured; frize dotted; antennae ferruginous; legs piceous. An English species. Marsh.


Carabus cebestus. Ferruginous and hispid; head and thorax dusky, punctured; wing-cases fratured, with a large black spot. Inhabits England. Marsh.


Carabus fumosus. Dusty-black; wing-cases somewhat fratured at the tip; thighs pale at the base. Inhabits England. Marsh.


Carabus egerzatus. Black; antennae ferruginous; wing-cases and legs tesselaceous. An English species. Marsh.


Carabus circulatus. Black; antennae, legs, and margin of the shells tesselaceous. Found under stones by the side of the river Usk, near Crickhowell, Monmouthshire. Marsh.

Carabus porpusus-ceruliscus. Bluish-black; wing-cases fratured, with numerous punctures between the frize; antennae, feelers, and legs rufous. Found near Malton in Efex. One of the new English species described by Mr. Marsh. Ent. Brit.


Carabus fulvus. Ferruginous; legs paler; eyes black. Inhabit England, and varies in having the legs more or less pale.


Carabus leprous. Blue; base of the antennae, and legs ferruginous; shells brown, with two white spots. Inhabit Denmark. Pontopp.

Carabus Insolens. Dusty-black, beneath black; legs tesselaceous; shells fratured, the lateral margin yellowish-grey. Inhabit Siberia. Pallas.

Carabus aiaceus. Apterous, black, and without spots; thorax
CARABUS.

Thorax rounded behind and grooved. Inhabits the Cape of Good Hope. Thunberg.

Carabus humilissimus. Apterous; black; thorax lustrous; wing-cases lustrous. Thunberg. Inhabits the Cape of Good Hope. Obs. This is about the size of Carabus violaceus, but broader and more depressed.

Carabus dufciformis. Apterous, black; thorax transverse, truncated behind; shells lustrous. Thunberg. An African species, found at the Cape of Good Hope. Size of C. bartenius.

Carabus donaldus. Black; antenna and wing-cases red, with a black margin. Inhabits the Cape of Good Hope. Thunberg.

Carabus obtusus. Thorax and wing-cases fuscous; head, antenna, and legs red. Found at the Cape of Good Hope. Thunberg.

Carabus offer. Black; antenna and legs reddish; wing-cases smooth. Thunberg. Inhabits the Cape of Good Hope. Same size as Carabus vulgaris.

Carabus Capensis. Ferruginous; thorax and future of the shells with a longitudinal black line. Inhabits the Cape of Good Hope. Thunberg. Obs. The body is glabrous; abdomen black or ferruginous.

Carabus siliate. Ferruginous; shells with a black band. Inhabits the Cape of Good Hope. Thunberg. This is very closely allied to Carabus siliateus, and may be the same species.

Carabus fimbratus. Apterous, black; sides of the thorax, and margin of the wing-cases downy white. An African species. Herbdt.

Carabus Herbsti. Shells transversely undulated with three rows of golden dots. Inhabits Germany.

Carabus Pomeranus. Coppery, beneath black; shells with three rows of raised dots, and decumbent frize. A native of Pomerania. Herbdt.

Carabus cylindricus. Black, cylindrical; thorax narrowed, and grooved in the middle; shells with nine grooves, and dotted on the outer margin. Herbdt.

Carabus marchicus. Beneath black; head and thorax light grey; feelers and antennae brown, ferruginous at the base. Inhabits Prussia. Herbdt.

Carabus fimbriatus. Brown; head and thorax brassy-green; legs pale. Inhabits India. Herbdt.

Carabus mungo. Piceous; legs fimbriatus; antenna and margin of the thorax yellowish; shells with eight frize. Inhabits India. Herbdt.


Carabus Indicus. Black; antennae grey at the tip; thorax with an impressed line; wing-cases with seven grooves. Inhabits India. Herbdt.


Carabus atratus. Entirely glossy-black; thorax rounded; shells obliquely striated, with four indented dots at the future. Inhabitats Prussia. Herbdt Gmel.


Carabus bipinatus. Black, beneath brown; shells blue, with nine punctured frize, the outermost created. Inhabitats Prussia. Herbdt. ap. Fuceli.


Carabus vivi. Black; antenna and legs brown; the...
CARABUS.

CARABUS pubeceus. Black, downy; wing-cases fringed; antennae, feelers, and legs fulvous. Inhabits Europe. Müll.

CARABUS levis. Brassy; head and thorax green; wing-cases coppery; legs piceous. Inhabits Denmark. Müll.

CARABUS vernultr. Black; antennae, feelers, and legs yellow; wing-cases fringed with dots. Müll.

CARABUS pullicus. Black; wing-cases fringed; legs piceous. Inhabits Denmark. Müll.


CARABUS rubicundus. Apterous, beneath black; thorax violet; wing-cases reddish, the future and margin white. Lepechin. Inhabits Russia.

CARABUS Forsteri. Black; head, thorax, and shells glossy-green; antennae and legs rusous. Inhabits America. Forster.

CARABUS lineatus. Thorax ferruginous; wing-cases grey, with a common black line at the future, and another in the middle; legs grey; tarsi black. Inhabits America. Forster.

CARABUS fulvocarinus. Black; wing-cases with smooth fririe, the outermost punctured; feelers, antennae, and legs pale yellow. Inhabits Europe. Hoppe.

CARABUS adspersus. Apterous; above brassy-green, beneath black; wing-cases with four rows of indented gold dots and raised lines. Inhabit Europe. Degeer. Gmelin.

CARABUS varius. Above brassy-black, beneath black; body ovate and short; thorax convex; wing-cases smooth; antennae rufous at the base. Inhabit Europe. Degeer. Gmelin.

CARABUS versicolor. Brassy, body ovate and short, brassy black above, beneath black; thorax convex; wing-cases smooth; antennae rufous at the base. Inhabit Europe. Degeer. Gmelin.

CARABUS subfriatus. Shining black; shells slightly fririated, with four impressed dots. Inhabit Europe. Degeer. Gmelin.

CARABUS Pennsylvanius. Reddish-brown; head dusky; wing-cases frirated; body beneath, legs, and antennae telfaceous. Degeer. Inhabit Europe.

CARABUS balticus. Black; shells frirated, and ferruginous towards the thorax; antennae and legs telfaceous. Inhabit Saxony. Schall.

CARABUS mercus. Black; wing-cases frirated, and thorax rough and opaque. Inhabit Saxony.

CARABUS Schalleri. Black; smooth; wing-cases with very minute punctured firiie.

CARABUS S-friatus. Green, punctured; wing-cases with eight firiie; legs pale. Inhabit France. Geoffr.

CARABUS minutus. Shining-green; wing-cases with eight firiie and three impressed dots; legs pale. Inhabit France. Geoffr.


CARABUS nobilis. Black; thorax deep black; wing-cases red, with a black cross. Inhabit France. Geoffr.

CARABUS aurantius. Shining; head and shells green; thorax coppery, with twelve dots. Inhabit France. Geoffr.

CARABUS striatus. Black, thorax ferruginous; wing-cases frirated, with four livid spots. Inhabit France. Geoffr.

CARABUS nigricollis. Entirely black; wing-cases frirated, with four livid spots. Inhabit France. Geoffr.


CARABUS tenebrifer. Black, thorax broad; wing-cases frirated, with punctures. Inhabit France. Geoffr.


CARABUS f-suffus. Piceous; thorax with an excavated longitudinal line; ends of the legs spurious. Inhabit Europe. Scoptoli.

CARABUS elegans. Thorax linear, and as long as the shells; legs rufous. Inhabit Europe. Scoptoli.


CARABUS Scopoli. Brassy-green; wing-cases telfaceous, with the whole margin and band fulvous. Inhabits Carniola. Scoptoli.

CARABUS falcinarius. Black dotted; wing-cases fulvous, frirated; antennae and legs ferruginous. Inhabit Carniola. Scoptoli. Found on willows, &c.

CARABUS arenarius. Brassy-fuscous; thorax somewhat roundish, and dentated behind; legs rufous. Inhabit sandy places in Carniola. Scoptoli.


CARABUS atomarius. Apterous, black, glabrous; wing-cases edged with violaceous, smooth, and sprinkled with minute, confluent, violaceous dots. Muf. Leitk. Gmelin.

CARABUS miliarius. Apterous, black; wing-cases with elevated fuscous dots; outer margins brassy-violet. Inhabit Europe. Leitk. Gmelin.

CARABUS frutatus. Apterous, black; wing-cases ridged, the alternate ridges broken irregularly. Inhabit Europe. Leitk. Gmelin.

CARABUS cypris. Apterous, black, and coppery; wing-cases with four ridges each, containing three rows of elevated dots. Inhabit Europe. Leitk. Gmelin.

CARABUS 5-lineatus. Black; thorax rounded, laterally truncated behind with an impressed dorso line, and a double one on each side at the base; wing-cases ridged. the five innermost joining the fixth at the tip. Inhabit Europe. Leitk. Gmelin.

CARABUS tricolor. Ferruginous black; head, antennae at the base, and thorax black; wing-cases defrinated, frirated, tip truncated, and with the outer edge of the thorax ferruginous. Inhabit Europe. Leitk. Gmelin. Obi. Antennae cinereous and glabrous.

CARABUS confusa. Black; thorax rounded at the sides; wing-cases frirated, the first and eighth, second and seventh, united at the tip. Inhabit Europe. Leitk. Gmelin.

CARABUS Lefkii. Deep black; head and thorax black; wing-cases brown, with fily fixth; antennae and legs ferruginous. Inhabit Europe. Leitk. Gmelin.

CARABUS tricolor. Black; antennae and legs ferruginous; wing-cases finely frirated; head and thorax brassy, the latter with an impressed dorso line, and two smaller on each side behind. Leitk. Gmelin makes three varieties of this species; namely, B Carabus antennis basi rubris. Leitk. 7 Carabus ater. Leitk. 8 Carabus neger. Leitk. All these inhabit Europe.

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CARABUS.
CARABUS pallidus. Ferruginous black; wing-cases frigilated; antennae rufous. Inhabits Europe. Leck. Gmel.

CARABUS quadratus. Thorax nearly square, with an impressed dorso-lateral line, and a smaller one on each side behind; wing-cases frigilated. Leck. Gmel.


CARABUS emarginatus. Black; thorax nearly square, and truncated behind; wing-cases frigilated and emarginated at the tip. Inhabits Europe. Leck. Gmel.


CARABUS erythrocephalus. Black; thorax nearly square, and rounded at the sides; wing-cases frigilated; antennae rufous; legs ferruginous. Inhabits Europe. Leck. Gmel.

CARABUS concinor. Black; thorax nearly square; shells deep black, and very finely frigilated. Inhabits Europe. Leck. Gmel.

CARABUS erythrocephalus. Black; thorax square behind; wing-cases frigilated; antennae and legs rufous. Inhabits Europe. Leck. Gmel.


CARABUS rubicoris. Black, antenne red; posterior part of the thorax truncated, with an impressed dorso-lateral line. Inhabits Europe. Leck. Gmel.


CARABUS viridatus. Greenish-black; antenna and legs rufous; wing-cases frigilated with flat finely punctured ridges. Inhabits Europe. Leck.

CARABUS multicolor. Black, head and thorax green; wing-cases bluish-green, with yellow down; mouth, base of the antennae, and the legs rufous. Inhabits Europe. Leck.

CARABUS obtusatus. Fusceous, thorax truncated behind; wing-cases frigilated; antennae and legs ferruginous. Inhabits Europe. Leck.

CARABUS obtusatus. Black; wing-cases frigilated; flanks ferruginous. Inhabits Europe. Leck.

CARABUS ecepus. Ferruginous-glabratus; thorax truncated before and jagged behind; wing-cases frigilated. Inhabits Europe. Leck.

CARABUS limbatis. Black; thorax margined, plaited behind; wing-cases frigilated; legs black-ferruginous. Inhabits Europe. Leck.

CARABUS trunculatus. Black; thorax truncated behind; wing-cases frigilated; legs ferruginous-brown. Inhabits Europe. Leck.

CARABUS chloromelas. Black, above green; antennae and legs ferruginous. Inhabits Europe. Leck.

CARABUS sinuatus. Black; wing-cases frigilated, and frigilated at the apex; antennae rufous at the base. Inhabits Europe. Leck.

CARABUS pallidicorne. Black; wing-cases frigilated; thorax truncated behind; outer margin, with the legs and antennae, pale. Inhabits Europe. Leck.


CARABUS rotundatus. Black, above brassy; thorax rounded; wing-cases frigilated; flanks ferruginous. Inhabits Europe. Leck.

CARABUS lituratus. Picceous; head, legs, and wing-cases telfacous, the belly with a common black violet spot at the tip; thorax violet. Inhabits Europe. Leck.

CARABUS cylindricus. Telfacous, cylindrical; head black; thorax orbicular and rufous. Inhabits Europe. Leck.

CARABUS 4-setatus. Black, thorax orbicular; wing-cases blue-brown, with four telfacous dots; legs telfacous. Inhabits Europe. Leck.

CARABUS 6-setatus. Brassy-black; thorax rounded; wing-cases frigilated, with three pair of impress'd dots at the future. Inhabits Europe. Leck.

CARABUS fuscicornis. Black, above brassy; thorax rounded and punctured; wing-cases with crenated frigia; antennae brown; legs rufous. Inhabits Europe. Leck.

CARABUS trispinos. Black; head and orbicular thorax brassy; wing-cases ferruginous, brassy, and frigilated with punctures; legs rufous; thigh thick; flanks spinous. Inhabits Europe. Leck.

CARABUS meffus. Ferruginous; thorax rounded; wing-cases frigilated; head brown; antennae and legs telfacous. Inhabits Europe. Leck.

CARABUS porphyropus. Picceous, thorax truncated; wing-cases frigilated; antennae and flanks rufous. Inhabits Europe. Leck.

CARABUS atratus. Black; thorax orbicular; wing-cases pale, varie'd with black; antennae and legs ferruginous fulvus. Inhabits Europe. Leck.

CARABUS lepidus. Above brassy-green, beneath bluish; thorax nearly square, with four impress'd frigia behind; anterior flanks dilated at the tip. Inhabits Eu. Leck.

CARAC, Karen, or Charedis, in Geography. See Karé.

CARACA, in Botany, Rumphi. Amb. 5. p. 373. tab. 132. See DOLICHOS bulbif. caracala, in Zoology, an animal of the lynx tribe, by some called the Perian lynx. See Felis caracal.

CARACALLA, in Antiquity, a long garment, having a fort of capuchin or hood a-top, and reaching to the heels; worn equally among the Romans by the men and the women, in the city and the camp.

Spartan and Xiphilini represent the emperor Caracalla as the inventor of this garment, and hence suppose the appellation caracalla was first given him. Others, with more probability, make the caracalla originally a Gallic habit, and only brought to Rome by the emperor above-mentioned, who did enjoined the foldery to wear it. The people called it Antonian, from the same prince, who had borrowed the name of Antonius.

The caracalla was a sort of casack, or fourout. Salmainius, Scaliger, and after them Du-Cange, even take the name casack to have been formed from that of carace, for caracalla. This is certain from St. Jerome, (ep. 126, ad Fabiolam,) that the caracalla which became an ecclesiastical garment, was a kind of cloak with a cowl; for both he, and Euclarius, (Instruction. l. ii. c. 10.), describing the

ephod,
Caracalla. 

Caracalla, in Biography and History, a Roman emperor, was the son of the emperor Severus and Julia Domna, and born A.D. 188. At the age of eight years, his family name "Bavianus," which he derived from his maternal grandfather, was changed by Severus, on his becoming emperor, into the highly respected names of Marcus Aurelius Antoninus; conferring upon him at the same time the dignity of Cæsar, which title was confirmed to him in the following year, viz. A.D. 215, by a decree of the senate. By these names he chose to be distinguished; but his infamous conduct has caused his history to be transmitted to posterity under the nick-name of Caracalla, which was occasioned by his fondness for a Gaulish robe so called, (see the preceding article) worn by him in preference to any other, and gratuitously distributed among his soldiery and the inhabitants of Rome, for their use. In his eleventh year, the emperor induced the soldiers, after the capture of Cæsiphon, to proclaim him "Augustus." Geta his brother, receiving at the same time the title of Cæsar, and the name of Antoninus. The act of the soldiery was confirmed by the senate, and Severus recompensed them with liberal donations. Before he had completed his 14th year, the emperor, whilst he was at Antioch, prosecuting a war against the Jews, in which this youth had the title of commander, and for the successful issue of which the senate decreed him a triumph, gave him the manly robe, and made him his colleague in the confuinction, A.D. 202. In the following year he married the daughter of Plautianus, the praetorian prefect, and an infatant favourite, whose abuse of the infamous power with which he was entrusted, brought him to an untimely end. Caracalla was instrumental in procuring the prefect's death, A.D. 205; and his hatred of the father was soon followed by an invincible dislike of the daughter, whom he had married against his inclination. To the ruin of Plautianus succeeded that of his family; for his son Phatus, and daughter Plautilla, were banished to the island of Lipari, where they languished in misery and perpetual alarms, till Caracalla, after he became emperor, ordered them to be killed. Caracalla and his brother Geta, who was declared "Augustus," and invested with the tributional power, A.D. 208, had conceived from their infancy an implacable hatred against one another. With a view of diverting their minds and allaying the animosity that subsisted between them, Severus took them with him in his expedition to Britain. But the ambition of Caracalla led him to avail himself of every opportunity that occurred for ingratiating himself with the officers and soldiery, and for inducing them to acknowledge him sole emperor in prejudice to his brother, whom he regarded as an odious rival. In order to halten his attainment of the sovereign power, he even attempted to murder his father, whilst he was concluding a treaty with the Britons, and receiving their arms. He afterwards intrigued with the officers and soldiery for the purpose of deposing him. Some have said, that during his left illness, Caracalla endeavoured to bribe the physician, who attended him, in order to hasten his death. Severus, who died at York, A.D. 211, was succeeded by his two sons, whom he had inculcated with the sovereign power during his lifetime, and by his last will appointed to reign jointly after his death. The early antipathy that subsisted between the two brothers was incalculable; and the intrigues, rebukes, and exhortations, both of their father and their preceptor Anipater, had been altogether ineffectual to their reconciliation. As soon as Severus had expired, Caracalla endeavoured to exclude his brother, by his influence with the army, from any share in the sovereignty; but the soldiery, protesting that they would equally obey both the sons of Severus, as he had appointed both to succeed him, was forced to acknowledge his brother partner in the empire, and to suffer the soldiery to take the usual oath of allegiance to each. After this ceremony, Caracalla concluded a shameful treaty with the Britons; and both the brothers, about the middle of summer, set out for Rome with their mother Julia, and the ashes of their deceased father. In the progress of their journey, Caracalla attempted to murder Geta; and this attempt increased their mutual animosity and jealousy to such a degree, that they afterwards marched with their separate guards, and with no less wariness than if they had been in an enemy's country; lodging constantly in different houses, and carefully watching the motions of each other. On their arrival at Rome, they were received with great solemnity: but the discord that prevailed, and that was every day increasing between the two princes, produced two contending factions; and it was therefore proposed to make a division of the empire between them. Geta, who loved a quiet life, confounded, that if Caracalla would surrender Aelia and Egypt, he would retire to Alexandria, or Antioch, and leave him in unmolested possession of the rest of the empire. But this scheme was defeated by their mother Julia. Towards the close of this year, Caracalla made another attempt to murder his brother during the feast of Saturn; and this outrage occasioned almost an open war between the two princes, and a great deal of bloodshed. In the following year, A.D. 212, he effected his purpose, on occasion of an interview which was proposed, with a view to their reconciliation; when some centurions whom he had placed in ambush rushing on Geta with their swords in their hands, and urged on by the monster Caracalla himself, dispatched him with many wounds, whilst he was seeking refuge in the arms of his mother, who in endeavouring to save him was herself also wounded. Having by this atrocious act made himself sole master of the empire, he conciliated the attachment of the army by the most extravagant donations, and by circulating reports, as well as by public declarations, that his brother was a traitor, and that he had slain him unwillingly in his own defence, he established his own power. In order to include the soldiery and the people, and to gain credit to these unfounded pretences, he repaired to the camp of the praetorian cohorts, and prostrating himself upon the ground before the images of the tutelary deities, he offered up sacrifices of thanksgiving for his happy escape; justifying himself also by similar declarations to the senate, before which he appeared, surrounded with his guards, and armed with a cuirass, he obtained the approbation of that house and venal assembly. By artifices of this nature he succeeded in prevailing with the praetorians to declare him sole emperor, and Geta a public enemy. That Caracalla himself was active as one of the executioners in
the afflication of his brother is not improbable, if we consider, that some years after this event, he consecrated in the temple of Serapis, at Alexandria, the sword which he had used in the murder of Geta. When the savage deed was perpetrated, he forbade his mother, by menaces against her life, even exhibiting any signs of sorrow on the occasion: and he actually put to death Faflilla, the only remaining daughter of Marcus Aurelius, for disobeying a similar injunction.

In order to conciliate the Senate, he made an exertion of clemency, by allowing all exiles to return to the city; and as he made no distinction between the innocent and the guilty, he thus filled Rome with multitudes of villains who had richly deserved the punishment inflicted on them. With a view of satisfying the public, Caracalla permitted the memory of his brother to be honoured, using at the same time this memorable expression, "Sit divus, non sit vindex," i.e. "Let him be a god, as long as he is not alive," and accordingly the Senate issued a decree, by which he was enrolled among the gods. Notwithstanding these apparent but unavailing tokens of clemency, and this seeming respect for his deceased brother, Caracalla was rigorous and cruel in his conduct towards all those who manifested any respect for Geta, or who had any connection with him whilst he lived; and he adopted every method which he could devise for erasing the remembrance of him from the minds of survivors. Dion Cassius informs us, that in the general massacre of his partisans and friends, he ordered all his domestics, to the number of 20,000 persons, to be inhumanly put to death; it was death even to mention his name; and no one was allowed to use it even on the stage, where it was familiarly applied to slaves. All the money that bore his name was ordered to be melted down; and the inscriptions were erased. The dead bodies of those who were massacred were treated with indignity, burnt without ceremony, or were exposed to the beasts and birds of prey. Not satisfied with the murder of perfons of inferior rank, Caracalla sacrificed to his rage and jealousy a great number of illustrious victims, among whom, Papinius, the pretorian prefect, and the most eminent civilian in the opinion of Zosimus and Cassius, that ever lived, was the most distinguished. Papinius had returned the confidence of Severus by faithful and zealous endeavours to promote union and concord between the two brothers; and having thus disgraced Caracalla, he was deprived of the post of prefect of praetorian prefect. But the immediate cause of his death was his laudable refusal to concur in furnishing Caracalla with apologies for the murder of his brother. "It is easier," he nobly replied, "to commit a parricide, than to justify it; and to accuse an innocent person is a second parricide." In short, no sex, rank, or age, escaped the cruelty of this monster of wickenedfins: and he seems to have equaled, or even exceeded Caligula in the indulgence of the most malignant passions. Indeed, in another respect he also resembled him, as a portion of real inhumanity seems to have blended itself with a temper and character radically and habitually vicious. His acts of repine and extortion corresponded to those of his cruelty; and he seems to have made it his study through his whole reign to harass and oppress his people. Fond of public spectacles, he squandered with profusion in the support of these, what he extorted from the people; and his prodigality to the soldiers, with a view of engaging their affections, was unbounded. In games and shows he himself took an active part, fighting on occasions of this kind with wild beasts, and driving chariots in the circus. Whilst he indulged a taste altogether unfavourable to his high rank and office, and the meanest kind of curiosity and iniquitous, he defied every quality that was likely to command esteem; and his ignorance, and his contempt of literature and of learned men, were notorious. His debaucheries were as detestable as his other bad qualities; and yet, with an unpronounceable hypocrisy, he affected zeal for chastity and even for religion, though he forbade any one's calling him by the names of the divinities he worshipped: but his pretended piety was blended with a passion for the delusive arts of magic and judicial astrology.

Having established in the capital of his empire a character detestable for cruelty and oppression, and levelling the press of complaints against the Roman people by extending them to all the subjects of his empire, he determined to trace the footsteps of Alexander the Great, for whom he professed an extraordinary veneration, in the path of military glory. Ambitions of resembling this conqueror in every circumstance of his history, he conceived it to be his duty to associate upon the most intimate terms with his ministers, and to take part with them in all their military labours and exertions; and having thus fitted himself, as he conceived, for all the offices of a great commander, he left Italy, A.D. 213, and commenced his expeditions by visiting Gaul, where he exercised such cruelties that he was more hated and abhorred there than he had ever been at Rome. He afterwards crossed the Rhine, and conducted an expedition against the Catti and the Alamanii, now full mentioned in history; but he was obliged to purchase a peace with large sums, and the liberty of returning with safety into the Roman dominions. As soon as it was known in Germany that he had bought a peace of these people, all the nations inhabiting that extensive country flew to arms, and compelled him to grant them yearly pensions, the supply of which reduced him to the necessity of coining false money. In an interview with the Barbarians on this occasion, he was guilty of an act of perfidy, which of itself is sufficient to fix an indelible stain on his memory. Having ordered all the youth of Noricum to take arms, and join him, he commanded his troops to fall upon them and to put them all to the sword. For this pretended victory he assumed the title of "Alamanicus." From the borders of the Rhine he marched to the Lower Danube, and obtained some favorable advantages over the Barbarians, then hardly known, but afterwards too intimately connected with the affairs of declining Rome, called by the Romans Geta, and in subsequent times Goths. Having made an agreement with the Dacians, he passed from the banks of the Danube into Thrace; and afterwards crossing the Hellespont, he arrived at Ilium, and paid obsequious honours to the memory of Achilles at his supposed tomb. The death of Fellus, his favourite freedman, whom he is supposed to have poisoned, for the purpose which he proposed, furnish him with an opportunity of resembling Achilles in his funeral of Patroclus. Accordingly, he spared no expense in rendering the obsequies of Fellus extremely pompous. From Ilium he went to Pergamus, to seek relief in the temple of Aesculapius, under the disorders of mind and body, of which he had reason to complain, and which were probably owing to the agitation of remorse and terror. Having spent the winter at Nicomedias, he prepared for attacking the Parthians and Armenians; but Artabanus was under a necessity, on account of the intestine divisions of Parthia, to avert the attack by a timely submission. By the baleful perfidy, he made captives of Abgarus, king of Edessa, and the king of Armenia; but the only fruit which Caracalla reap'd from his perfidy was the defeat of Thecoritus, one of his generals, the consequent shame he so justly merited, and the universal detest of all mankind. However, he possessed a soul incapable of feeling such humiliations; and therefore gloried in the success of his exploits, and wrote haughty and boastful letters.
letters to the Senate on the occasion, as Caligula had done before him. At Alexandria, whither he next went, he profitably availed himself of an opportunity that offered itself of avenging himself on the Alexandrians for some raillery which these voluble and facetious people had formerly thrown out against him. The measure he adopted for this purpose was the most horrible massacre which history records. Having declared his intention of rendering personal homage to the god Serapis, the Alexandrians received him with every possible token of respect. Upon his first entrance into the sacred temple, he sacrificed whole hecatombs, and burnt upon the altar a great quantity of incense. From thence he proceeded to the tomb of Alexander, and rendered peculiar honours to the deceased hero. All these specious and pompous appearances served, however, to conceal his black design of extirpating the inhabitants of Alexandria. In the midst of the festivities produced by the delusion he was practising, he directed, from his pont in the temple of Serapis, his troops to fall on the assembled inhabitants and to make an undistinguished slaughter. Many thousands of natives and strangers fell in the carnage, and an universal pillage succeeded, which, with the fevers that followed this horrid massacre, reduced their flourishing capital almost to a state of desolation. This desolation, however, was but a temporary evil; for Caracalla not long afterwards, Alexandria recovered its splendour by its own resources, and soon became again the second city of the empire. Caracalla having completed his purposes of vengeance at Alexandria, determined to proceed towards Parthia; and making Artabanus's refusal to give him his daughter in marriage a pretext for violating the peace which had been concluded between the empires, he ravaged a large tract of country, plundered the cities, and after overrunning all Media, drew near the royal capital, where, like a dastardly enemy, he vented his fury even upon the dead, opening the tombs of the Arsacidæ, and scattering their ashes to the wind. Upon his return to Mesopotamia he boasted that he had conquered the Parthians, whom he had not even seen, and in his letters to the Senate and Roman people, he pretended that he had subdued all the East, and obliged every country beyond the Euphrates to acknowledge their laws. In consequence of these pretences, he obtained from the Senate the appellation of "Parthicus," and a decree for a triumph. The war would have been furiously renewed if a domestic conspiracy had not put an end to the miseries inflicted on the world by this detestable tyrant. M. Opillius Macrinus had risen from a low station to the post of praetorian prefect; but he had incurred the jealousy and hatred of Caracalla, whose suspicion was increased by the prediction of a diviner, that he was to succeed him on the throne. The circumstances of Macrinus were become critical, in consequence of some dispatches from Rome, which accidentally fell into his hands; and in order to evade the stroke which was meditated against him, he employed a disconnected centurion, named Martialis, to assassinate the emperor. Accordingly, while he was pursuing his journey from the city where he had wintered, to Carthage, for the purpose of being a fasciace in the temple of the Moon, a call of men obliged him to alight: Martialis seized the opportunity when he was almost alone, to dispatch him with a stab. The assassin instantly fled; but he was pursued, and, by some of the emperor's attendants, killed Caracalla on the 8th of April, A.D. 217, at the age of 29 years, and after a reign of six years, two days; his death was regretted by the feliciter Macrinus treated as a god, a prince whom he had been instrumental in killing; and the Senate, by his orders, decreed him divine honours. Thus, this monster, detested by heaven and earth, had his temple, his priests, and festivals, established for the worship of him at Rome. The authors who lived under Caracalla were Q. Suetonius Sarmionicus, murdered by his order; Titus Marius, and Oppian. The principal historians of this period are Herodian, Dion Callius, and Spartian. Crevier's Hist. of the Emperors, vol. viii. Aug. Uni. Hist. vol. xiii.

CARACELLA, in Botany. See PHASEOLUS CARACELLA.

CARACARA, in Ornithology, the name under which Buffon describes the Brazilian kite. See Falco Brafifinit. The same name caracara has been also given to the gold-breasted trumpeter, Psophia Cretips, which see.

CARACARAS, in Zoology, a species of snake. See Cobræ.

CARRACCA, LA, in Geography, a sea-port town of Spain, in the province of Andalusia; two leagues E. of Cadiz.

CARACASS, a district of Terra Firma in South America, belonging to the Spaniards. It lies between the province of Venezuela to the west, and that of Cumana to the east, and is bounded on the north by the Caribbean sea, and on the south, by parts of America little known. The coast is rocky and mountainous, but its valleys and plains are fertile, and produce the cacao-tree, indigo, fugar, and tobacco. The air is reckoned clear, and the climate wholesome. Its principal towns are Caracas, the capital, y Portu Calvallo, which is a sea-port town. In consequence of the acknowledged superiority of the cacao nuts in this province, and its communication with the Atlantic which facilitates the conveyance to Europe, the culture of the cacao there is more extensive than in any district of America. However, the Dutch, by the vicinity of their settlements in the small islands of Curacoa and Buen-Ayre, to the coast of Caraccas, gradually ingrossed the greatest part of the cacao-trade. Hence the traffic with the mother country ceased almost entirely; and such was the supine negligence of the Spaniards, or such were the defects of their commercial arrangements, that they were obliged to receive from the hands of foreigners this production of their own colonies, at an exorbitant price. In order to remedy an evil so lefs disgraceful, than pernicious to his subject, Philip V. in 1728, granted to a body of merchants an exclusive right to the commerce with Caracass and Cumana, on condition of their employing at their own expense, a sufficient number of armed vessels to clear the coast of pirates. This society, sometimes distinguished by the name of the company of Guipufcon, from the province of Spain in which it was established, and sometimes by that of the company of Caracass, from the district of America to which it trades, has carried on its operations with such vigour and success, that Spain has recovered an important branch of commerce, which she had suffered to be wrested from her, and is plentifully supplied with an article of extensive consumption at a moderate price. From this institution the colony, as well as the parent state, has derived great advantage. The planters in the Caraccas are not left to depend entirely on the company either for the importation of European commodities, or the sale of their own productions. The inhabitants of the Canary islands have the privilege of sending thither annually a regifter ship of considerable burden; and from Vera Cruz in New Spain, a free trade is permitted to every port comprehended in the charter of the company. Hence arises a competition which tends to fix the price of all commodities, both purchased and sold, at its natural and equitable rate. The company has not the power of raising the former or degrading the latter.
CARACCI.

Caracci, Agostina, the elder brother of Annibale and the disciple of Ludovico, was born at Bologna in 1537; and having first studied his art in the school of Prospero Fontana, but afterwards becoming a disciple of Palma, he laid the foundation of his eminence under the direction of his inimitable Ludovico. He affixed Annibale in the Farnese gallery, but left affidius than his brother, he devoted much time to engraving, which he had learned from Cornelius Cors. "He combined," says Mr. Fubeli, "with some learning, a cultivated taste, correctness, and sometimes elegance of form, and a correggiacque colour, especially in fresco." The most celebrated picture of this master is the communion of St. Jerome, now at the Louvre, which has been often compared with its rival picture of the same subjeft by Domenichino. "These two pictures," says Mr. Fubeli, "have often been compared without much discrimination of the principles that distinguish either, and the result has commonly been in favour of Domenichino; but surely, if Agolino yields to his scholar in repose, and the placid economy of the whole, he far excels him in the principal figure, the expression and character of the faint." Agolino died in 1602. Pilkington.

Caracci, Annibale, an eminent painter of history, portrait, and landscape, was born at Bologna in 1560, and being a disciple of his cousin-german, Ludovico Caracci, he imbibed from him the bold principles of his art, as well as an ambition to arrive at perfection in the exaction of it. With this view he studied the works of Titian, Tintoretto, and Paolo Veronese, at Venice, and those of Correggio at Parma. At an early age he manifested proofs of an extensive genius, which not only surpassed the artifices of his time, but excited a general expectation of the excellence to which he attained. The fame of the Caracci having reached to Rome, Annibale was invited thither by the cardinal Farnese, and employed in painting the gallery which bears his name. But though he laboured ten years at this work, the avaricious ecclesiastic prevented him with only 500 crowns. At Rome he had an opportunity of observing the antique statues, the baso-relievois, and also the compositions of Raphael, and he was thus led to abandon his Bolognese manner, formed after that of Correggio, and to adopt another more learned, but more dry and leis natural, both in design and in colouring. There is a sameness in the manner of all the Caraccis; and the only difference between them is that which results from their diversity of temper and disposition. Annibale had more fire, boldness, and singularity of thought than the two others;
and his designs were more profound, his expression more lively, and his execution more firm. His genius was better adapted to poetical and profane, than to sacred subjects; though, when he attempted the latter, he generally succeeded. His talents were admirably formed for landscape: the forms of his trees are grand; and in representing objects after nature, he gave them a character that distinguishes them strongly. He is said to have been deficient, however, in his knowledge of the principles of the chiro, nor are all his local colours commendable: but upon the whole, no painter seems to have been more universal, more easy, more certain in every thing he did, nor more generally approved than Annibale. Annibale," says Mr. Pinelli, "though superior to his cousin and brother in power of execution and academic prowess, was inferior to them in taste, felicity, and judgment; in proof of which he deduces the matter-work of Annibale, viz. the Farnefe gallery; a work whose uniform vigour of execution nothing can equal but its imbecility and incongruity of conception; if impropriety of ornament were fixed by definition, the subject of that gallery might be quoted as the most decisive instances; the man of sense may admire the splendour, the exuberance, the concentration of powers displayed by Annibale de Caracci, but the man of sense must lament their misapplication in the Farnefe gallery." He died in 1609. Pilkington.

The three Caraccis, of each of whom we have above given a brief account, laid the foundation of that school which has been highly celebrated by the title of the academy of the Caraccis. Young men, who aspired to be great masters, reforted hither for instruction; and they were furnished with well chosen models of men and women, fine calls from the belt figures, from antique statues, and curious bafco-relievos; as well as the most capital designs of the great masters, the most instructive books pertaining to the art, and the lefions of a very noted anatomist, who taught whatever it was necessary to know, concerning the knitting of the bones, and the insertion of the muscles. Among the number of the excellent artists that were formed in this academy, were Guido, Domenichino, Albano, Lanfranc, Guercino, and many others. Pilkington.

CARACCOLI, ROBERT, a famous preacher, was born in 1475 of a noble family at Lecce in the kingdom of Naples. In early life he entered into the order of Minor Observants, and before the 30th year he acquired such reputation for pulpit eloquence, that Pope Nicholas V. dispensed with his obedience to his superior, and allowed him to dispone of himself at pleasure. Hence it has been said that he was less famous for facility of manners than for eloquence. After having been employed in several honourable commissions by the popes Calixtus III. and Sixtus IV. he became first bishop of Aquino, and afterwards of Lecce, where he died in 1495. As a preacher he was highly admired, and regarded as a model, with respect to tone, gesture, and manner, to all the young orators of his time. His sermons, which were adapted to a rude age, and which possess few graces of style, have been collected at different times; but most of them are contained in an edition at Venice, 3 vols. 1492, and at Lyons in 1592. Tiraboschi.

CARACHABAN, in Geography, a town of Persia, in the province of Ardibeizan; 80 miles W. of Tauris.

CARACO, in Zoology, an animal of the rat kind, nearly allied to the Great or Norway rat, described by Dr. Pallas as a native of Siberia. See Mus caracu.

CARACOL, in Architecture, is sometimes used for a stair-case in the form of a helix or spiral.

CARACOL, in Geography, a town of South America, between Guayaquil and Quito.

CARACOL, in the Manege, a motion which a cavalier makes half round; or a half-turn from left to right; changing hands: that his enemy may be uncertain on which side he intends to attack; whether in front or flank. The word comes from the Arabic garagel, and that from the Hebrew carac, incovere: but we have it immediately from the Spanish, where caraco signifies properly a snail, and figuratively the evolution deferred above.

CARACOL, in Military Language, is the half-turn each horseman in an army makes after his discharge, to pass from the front of the squadron to the rear.

CARACOL is also a sort of half wheel, or semicircular movement not only by one horsemans, but by a whole troop of cavalry, by means of which they perform a sort of winding, or serpentine motion, alternately on their right and on their left, in advancing towards the enemy. The object of this movement, or of the caraco, is to disquiet or annoy the enemy, to throw him into disorder or confusion, to conceal from him your intended point of attack, to induce him to divide or break, by distracting his attention, and to seize the favourable moment of falling upon him with advantage. The light horse are peculiarly calculated for this kind of manœuvre and attack. Velocity, indeed, is the principal excellence and very life of cavalry.

CARACOLI, in Commerce, a factitious metal whereof the natives of the Caribbean islands make a kind of ornament, in form of a half-moon, which is called by the fame name. The metal is brought from the Terra Firma; and the common opinion is, that it is composed of gold, silver, and copper; but the mixture is to perfect, that a metal results from the whole which never rules nor tarnishes, how long soever kept, either in the sea or the ground. The English and French goldsmiths have made frequent attempts to imitate it. Those who have succeeded best, use six parts of silver, three of purified copper, and one of gold. But the curious find all the imitations much inferior in beauty to the original metal of the savages.

M. Hauterive, procurator-general of Martinique, makes the caraco to be a compound of gold only with a sort of copper found in the Terra Firma of America. F. Labat takes it for a native, or simple metal. The Americans also make rings, buckles, cane-heads, and the like, of caraco.

CARACOMBO, in Geography, an African island, situated about 15 miles N. of the line, at a short distance N.W. of the island of St. Thomas, and a little above the mouth of the river Gabon. It produces a variety of fruits and plants peculiar to itself, besides birds and animals. It is not uncommon to find a hundred nests of birds floating on the water upon one branch of a tree, or a slender twig, thus guarding themselves against the attacks of serpents and lizards. The island is inhabited, as it is said, by an abandoned, profligate race both of men and women. The latter in particular are so lewd that they are said to prostitute themselves without discrimination and without shame.

CARACORES, in Sea Language, denote light veftals used by the natives of Borneo, and the adjacent islands, and also by the Dutch as guarda-costas in those latitudes. They are high at each end, and chiefly navigated with paddles, in the use of which they fit both within and without board, on narrow platforms of reeds, supported by bars rigg'd out across the veft, and one at the outer end on each side, which serve as balances to prevent its being upset. By placing three or four ranks of rowers on the platform of reeds
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reeds outside, and some within, they can multiply their number so as to proceed with great velocity. They have triple feets of bamboo for a tail, supported by thorns, on which is hoisted an oblong sail, bent to a foot of bamboo yar at the head, and a boom at the foot. The sail is hanked up a little, the yard has a bowline to keep to windward, and a brace or vang that heads aft. The sail rolls up or forth by a winch at the end of the boom. See Plate of Birds.

CARACORUM, or Holin, in Geography, a Tartar village, the position of which is marked, in the map of M. D'Anville and the Chinese Itineraries, about 600 miles to the north-west of Pekin. This village was gradually enabled by the election and residence of the sons and grandsons of Zingis. It contained two streets, the one of Chinese mechanics, the other of Mahometan traders; and the places of religious worship, one Nestorian church, two mosques, and twelve temples of various idols, represent in some degree the number and division of inhabitants. However, a French missionary declares, that the town of St. Denis, near Paris, was more considerable than the Tartar capital, and that the whole palace of Mangou was formerly equal to a tenth part of that Benedictine abbey.

CARACT, or CARAT, in Commerce, a denomination given to an imaginary weight, which expresses the degree of goodnes, finenes, and perfecon, or imperfection of gold. The whole mals is conceived to be divided into twenty-four equal parts, i.e. twenty-four carats; and the purity of the specimen is expressed by the number of carats of pure gold it contains. Thus gold of eighteen carats fine means a compound of $\frac{17}{24}$ths of pure gold, and $\frac{17}{24}$ths of some other metal: gold of twenty-two carats fine contains $\frac{17}{24}$ths of pure gold, and $\frac{17}{24}$ths of alloy; and pure gold is called gold of twenty-four carats fine.

The word is also written carat, carvet, karat, and karat. Its original is conjectured: but we choose to follow Kennet, who derives it from caretia, a term which this author observes anciently denoted any weight, and came not till of later days to be appropriated to that which this expresses the fineness of gold, and the gravity of diamonds. Others, however, derive it from the Arabic kirat, which is a weight half of a "dunck," or grain; of whichfix made up the "dirhem," or Arabic drachm; so that twelve "kirats" were equal to a "dirhem." See the next article.

The mint-men fix the highest purity and perfection of gold at twenty-four carats; and the several degrees are estimated from the divisions hereof, which are called granns: but it is to be observed, that what care ever is taken in purifying gold, to clear it from drans, it can never be brought to twenty-four carats; but full comes short, at least $\frac{1}{4}$ of a carat, or a grain; this grain they call a "fillet"; and this sixteenth they subdivide into two eights; and each of those eights into two sixteenths: on which calculation, they say, gold may be purified as far as the full sixteenth of the second eighth, but no further. Gold of twenty-two carats, is that which has twenty-two parts of fine gold, and two of silver, or other metal; or that which, in refining, loses two parts in twenty-four of its weight. The goldsmiths generally work in gold of twenty-two carats; that being the standard gold of this kingdom. By the laws of France they are prohibited from working in gold below twenty-three carats. In England, the carat is divided into four grains; in Germany, into twelve parts; and in France, into thirty two. The Chinese reckon by touches, a hundred of which correspond to our twenty-four carats. Carat fine, as above, is the twenty-fourth part of the goodness of a piece of pure gold. Carat price is the twenty-fourth part of the value of an ounce or mark of gold. They also sometimes lay, the carat weight, which is the twenty-fourth part of the weight of the ounce or mark. Two two grains make a carat grain.

CARAT is also the weight used in weighing diamonds, pearls, and precious stones; where it confides of four grains. In this sense, the word is by some supposed to be derived from escape, a fruit which the Latins call filipr, and we called banum: each of which may weigh about four grans of wheat: whence the Latin filipa has also been used for a weight of four grains. Blumen, (Appendix to his Travels in Abyssinia, p. 68) deduces it from the name of the bean of the Kama-tree, which is called "Carat." From the gold country in Africa it passed, as he supposes, to India; and there came to be the weight of precious stones, especially diamonds.

The carat by which jewellers estimate the weight of diamonds and pearls, is about $\frac{1}{45}$ of a troy ounce. Jefreyson Diamonds.

Hence the carat is about 3 grans troy.

Carats are divided into halves, quarters, or grains; and farther, into eights, sixteenths, and thirty-two parts. Id. ibid.

CARACTACUS, in Biography and British History, one of the most renowned of the British kings.

Among the proudest defenders of our ancient liberty, scarcely any one seems entitled to such ample notice as Caractacus, the victory over whom was acknowledged even by the conquerors of the world to have been one of the most important for the complete reduction of Britain that had ever been obtained.

What were the circumstances of his early years, or whether his education at all differed from that which was usually beflown upon his countrymen, we have no means to ascertain. The earliest account we hear of him is in the reign of Claudius, when Aulus Plautius, the first Roman general who landed on the island after Jullus Caesar, commanded the expedition against Britain. The Roman commander, it appears, was unapproached at his landing, and having passed through the Britishe fates upon the coast without resistance, pushed forward through the country in quest of those who possessed themselves of arms. This was in the year 43, when, by the direction of his guide, he first overtook and defeated Caractacus.

The spirit of this illustrious chief, however, was not to be subdued at once: and though, in the progress of the Roman arms immediately subsequent to this transaction, we hear but little of Caractacus, we are not to suppose he was otherwise employed than in inspiring his countrymen with the thoughts of vengeance.

Four years after Caractacus had lost the greater part of his dominions Aulus Plautius was recalled. The affairs of the island were left in the hands of the legates or commanders of the legions; and in the interval which occurred till the appointment of Ostorius Scapula as governor, A. D. 50, the Britons were enabled to gain some few advantages. Ostorius having restored the tranquility of the Roman province in the south call parts of Britain, marched against the Ceantis, who inhabited Cheshire, and part of Lancashire, opposite to Ireland: but was soon recalled by the intelligence of an insurrection among the Britains. It was not long, however, before he was called to encounter more determined enemies. These were the Silures, who occupied Herefordshire, Radnor, Brecknock, Monmouth, Glamorgan, and, in general, South Wales, a people naturally brave and fond of liberty, but who, at that juncture, were rendered not only more confident and bold in themselves, but more formidable to their enemies by the valor of their leader. Caractacus, who, as we
have already mentioned, had left the greatest part of his own dominions, willingly put himself at the head of this brave people, to make another effort for the deliverance of his country. He was skilled, we are told, in all the wiles and stratagems of savage warfare; and in point of local knowledge had greatly the advantage of the Roman general. And of this last, indeed, he availed himself by transferring the war into the country of the Orknevers, and by choosing a place for the field of battle, which was every way favourable to his own army, and incommode to his enemies. The spot he chose, in Shropshire, near the confluence of the Culm and Tame, is still called Cararoduc, and will be described under the head of CASTLE. Its ramparts and entrenchments are yet visible; and it exactly answers the description given by Tacitus. It was situated on the ridge of a steep mountain. In some places where the sides were accessible he fortified it with masonry stones, heaped together in the form of a rampart. At the foot of the mountain flowed a river with fords and shallows of uncertain depth. And a balb of men guarded his entrenchments.

The Roman general, observing the depthness of the river, the ruggedness of the mountain, the strength of the ramparts, and the loud acclamity of the enemy, was a little dismayed at such a succession of dangers. As long, says Tacitus, as they fought with misuse weapons, the Britons had the advantage. But when Ostorius ordered his men to advance under a military shield, and level the pile of stones that served as a defence to the enemy, a close engagement followed. The Britons, unable to sustain the shock, retired slowly towards the ridge of the mountain, and were eagerly followed by the Romans. In short, the Britons, being without defensive armour, the legions and auxiliaries made prodigious havoc; and the victory, at last, became decisive. The wife and daughter of Caracatus were taken prisoners; his brother surrendered at discretion; and he himself fled for protection to Cartimandua, the queen of the Brigantes. But adversity, says the Roman historian, has no friends. Cartimandua, who was his step-mother, loaded him with iron, delivered him to the conqueror, and he, with his whole family, were carried prisoners to Rome. Even there the name of Caracatus was in high celebrity: and curiosity was eager to behold the hero who, for nine years, had made a stand against the Roman arms. The emperor too, placed in the vanquished king, he determined to render his entry into Rome as solemn and public as possible; and the people were summoned to behold the spectacle as worthy of admiration. The followers of the Britifh chief, we are told, walked in procession. The military accoutrements, the harness and rich collars, which he had gained in various battles, were displayed with pomp. The wife of Caracatus, his daughter, and his brother, followed next: he himself closed the melancholy train. The rest of the prisoners, truck with terror, defended to mean and abject supplications. Caracatus alone was superior to misfortune. With a countenance still unaltered, not a symptom of fear appearing, no sorrow, no condeemnation, he behaved with dignity even in ruin; and being placed before the tribunal delivered himself in the following manner:

"If, to the nobility of my birth, and the splendour of exalted station, I had united the virtues of moderation, Rome had beheld me, not in captivity, but a royal visitor and a friend. The alliance of a prince, defended from all illustrious line of ancestors—a prince, whose fame extended over many nations, would not have been unworthy of your choice. A reverie of fortune is now the lot of Caracatus. The event to you is glorious, and to me humiliating. I had arms, and men, and horses; I had wealth in abundance; can you wonder that I was unwilling to lose them? The ambition of Rome aspires to universal dominion: and must mankind, by consequence, stretch their necks to the yoke? I stood at bay for years: had I acted otherwise, where, on your part, had been the glory of conquest, and where, on mine, the honour of a brave resistance? I am now in your power: if you are bent on vengeance, execute your purpose; the bloody scene will soon be over, and the name of Caracatus will sink into oblivion. Preferve my life, and I shall be to late posterity a monument of Roman clemency."

Claudius, it is enough to say, charmed with the boldness of his prisoner, pardoned both Caracatus and his family. The subsquent events of the Britifh chief's life had no historian to pen them. And here we are obliged to close his history.

The speech of Caracatus, which is here translated literally from Tacitus's Annals, was finely used by Mr. Mafon, in his celebrated dramatic poem. For the sake of epitical incidents, however, he has departed from the strict line of historical truth; and has transferred the honour of taking Caracatus prisoner, and sending him to Rome, from Ostorius to Aulus Didius. Tacit. Annal. i. xii. c. 35, et seq.

CARACTERE, Fr. as a dancer, à demi-charratere, in a style neither grotesque nor terre à terre; neither wholly comic nor serious.

CARADIVA, in Geography, an Asiatic island, near that of Ceylon, at the western point of the kingdom of Jaffnapatan: called by the Dutch Amrderam.

CARAGA, in Ancient Geography, Rugga, a town of Africa, 2 leagues S.S.E. of Tidus, mentioned by Ptol.emy.

CARAGACH, in Commerce, a cotton that comes from Smrna, by the way of Naficks.


Gen. Ch. Cal. one-leaved, bell-shaped-cylindrical, deeply divided on one side, with five short teeth. Cor. papilionata, standard egg-shaped, half erect; the sides folded upwards; wings oblong; keel straight, oblong, obtuse. Stam. filaments ten, diadelphous. Fil. germ superior, oblong, smooth; style straight; stigma smooth, truncate. Peric. legume oblong, inflated, smooth. Seeds four to fix, egg-shaped, a little globular, not compressed.

Eff. Ch. Calyx five-toothed. Stigma smooth, truncate. Legume oblong, almost cylindrical. Seeds nearly spherical. 1.3 March has formed this genus for some plants which Linnaeus referred to robinia. but which differ from its genuine species, both in the fructification and general habit. Their stigma is smooth, not downy; their legume nearly cylindrical, not compressed, and their seeds not flattened, as in robinia. Their leaves, moreover, are generally abruptly pinned, and the petioles often elongated, terminating in a thorny point.

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an odd leaf, but nevertheless evidently extended beyond it: the leaflets in the second year becoming a pair of short, spreading spines. Flowers yellow, filiform. *Leguminosae* an inch and half long, smooth, rather cylindrical, pointed. A native of Siberia. It grows best in a light, sandy soil, and is not injured by severe cold. Its leaves are good fodder for cattle, and are laid to produce a blue colouring matter.

2. *Carpinus betulus*, Linn. *Leaves* in six pairs, roundish, mucronate, mucronate; the leaflets filiform; leaflets simple, fleshy, but in pairs, two or three feet high. Leaves alternate, abruptly winged. *Flowers* yellow, axillary, solitary: peduncles slender long. A native of Siberia. 

3. *Carpinus betulus*, Linn. *Leaves* in eight pairs, roundish, mucronate, mucronate; the leaflets filiform; leaflets simple, fleshy, but in pairs, two or three feet high. Leaves alternate, abruptly winged. *Flowers* yellow, axillary, solitary: peduncles slender long. A native of Siberia.

4. *Carpinus betulus*, Linn. *Leaves* in four pairs, roundish, mucronate, mucronate; the leaflets filiform; leaflets simple, fleshy, but in pairs, two or three feet high. Leaves alternate, abruptly winged. *Flowers* yellow, axillary, solitary: peduncles slender long. A native of Siberia. On account of its long, tough branches, and large thorns, it is well adapted to make an impenetrable hedge; and, as it is covered with flowers near the whole of the summer, it is at the same time a very ornamental plant. It has the additional recommendation of being hardy, and able to bear the winters of our climate without injury. 

4. *Carpinus betulus*, Linn. *Leaves* in four pairs, roundish, mucronate, mucronate; the leaflets filiform; leaflets simple, fleshy, but in pairs, two or three feet high. Leaves alternate, abruptly winged. *Flowers* yellow, axillary, solitary: peduncles slender long. A native of Siberia. On account of its long, tough branches, and large thorns, it is well adapted to make an impenetrable hedge; and, as it is covered with flowers near the whole of the summer, it is at the same time a very ornamental plant. It has the additional recommendation of being hardy, and able to bear the winters of our climate without injury. 

CARAGAS, in Geography, a province of Mindanao, in the Earl Indies, situate on the easterly coast, between Subago and the Cape of St. Augustinum, which it north and south. The town of Caraga on this coast is a large town, and the principal trading port of the province. It is situated on the coast of Mindanao, and is the chief town of the province. It is the seat of the government of the province, and is the principal trading port. The inhabitants of Caraga are a warlike people, and are accounted very brave, when employed either by sea or land.

CARAGI, in Commerce, a name given to duties paid at the custom-house in the territories of the grand signor, on the importation or exportation of goods. The term is also applied to the officers of the custom-house, who collect these duties.

CARAGLIA, in Geography, a town of Piedmont, in the province of Coni; 5 miles N.W. of Coni.

CARAGNA, or CARAGNA, in Pharmacy. See CARAGGA.

CARAGROUCH, a silver coin of the empire, weighing nine drams, which does not quite amount to a French crown, of three livres Tournois. At Constantinople it goes at 120 sijors. There are four sorts of them, equally current, and of the same value.

CARAGUATA, in Botany, Plumb. gen. 10. See TILANDSIA.

CARALISSAR, in Geography. See APHIMON CARALISSAR.

CARAHISSAR. See CARAHISSAR.

CARAIOS, CAIROS, or KAIRIHOS, in Zoology, according to Mearcgrave, Pfan, and some other authors, the Brazilian name of the Virginia opium. See DIPLOPUS ODYSSEUM.

CARAIRPA, in Botany, Linn. Enc. Juffieu 434. A tree Guiana 531. a genus imperfectly known. Cliffs and order, polyandra monogyne. Cal. Perianth deeply divided into five round segments. Cor. unknown. P. Geran superiour. Peric. Capsule somewhat woody, rather three fixed, acute, and recurved at its summit, three-celled, opening from the summit to the base with three permanent valves. *Seeds* one in each cell; angular on the inner, convex on the outer side, attached to a large three-winged receptacle, which unites with the valves, forms the partitions of the cells.

Sp. 1. *C. parvifolia*, Aubl. tab. 223, fig. 1. "Leaves egg-shaped, acute, white with down underneath." A tree from fifteen to twenty feet high, much branched near the top.

3 R 2 Branches
Branches reddish. Leaves alternate, petioled, entire; ribs two, opposite, caducent. Flowers in terminal clusters; capsules hairy. 2. C. longifolia, Asl. tab. 223, fig. 2. "Leaves oblong, egg-shaped, scate, grey underneath." A larger and thicker tree than the preceding. Leaves eight inches long, and three broad. 3. C. leucoilis, Asl. tab. 224, fig. 3. "Leaves broad-egg-shaped, acuminate, dark-red underneath." 4. C. angustifolia, Asl. tab. 224. fig. 4. "Leaves long, egg-shaped, acuminate, white underneath." Leaves with more numerous lateral nerves, ten inches long, and two and a half broad. All the species are found in the forests of Guiana. The second is called caripe by the natives.

CARAITES, or CARAITES, כאריאטס, כאריאיטס, to read, a sect among the ancient Jews: wherever there are still some branches subsisting in Poland, Russia, Conantinople, Cairo, and other places of the Levant; though few or none are to be found in these western countries. About the middle of the 10th century, a particular account was taken of their number; which in Poland was 2000; at Cairo, 10000; at Damascus, 200; at Jerusalem, 30; in Babylon, 100; in Persia, 600; amounting in the whole to 15,250, and being a small number compared with the Rabbinists. It is their distinguishing tenet and practice to adhere closely to the words and letter of the Scripture, (as their name imports) exclusive of allegories, traditions, and the like.

Leo of Modena, a Rabbin of Venice, observes, that of all the heresies among those people, before the destruction of the temple, there is none now left but that of the Caraim, a name derived from mira, which signifies the pure text of the Bible; because of their keeping to the Pentateuch, observing it to the letter, and rejecting all interpretations, paraphrases, and constitutions of the Rabbinists. Aben Ezra, and some other Rabbinists, treat the Caraites as Sadducees; but Leo de Judæa calls them, more accurately, Sadducees reformed; because they believe the immortality of the soul, paradise, hell, resurrection, &c. which the ancient Sadducees denied. He adds, however, that they were doublets originally real Sadducees, and sprung from among them.

M. Simon, with more probability, supposes them to have risen hence; that the more knowing among the Jews, opposing the dreams and reveries of the Rabbinists, and using the pure texts of Scripture to refute their groundless traditions, had the name of Caraim given them; which signifies as much as the barbarous Latin, Scripture, i.e. people attached to the text of Scripture. The other Jews give them the odious name of Sadducees, from their agreement with those sectaries on the head of traditions. The real fact seems to have been, that the traditional law was opposed, as a corruption of the true religion, by a numerous body, who strenuously asserted the sufficiency and perfections of the ancient written law, explained in its literal sense. Among these were the Sadducees. But it is very probable, that the Sadducean tenets were highly offensive to many pious men, who nevertheless were not disposed to join those who received the traditional institutions. These, adhering simply to the letter of the Mosaic law, but at the same time refusing to adopt the doctrine of the Sadducees, would of course become a separate sect, which would be distinguished by some name expressive of their leading principle. It is not improbable that the opposite party gave them, in derision, the name of Scripture, or Caraites. Hence we may conclude, that this sect arose at the same time with those of the Sadducees and Pharisees. From the Jewish records it may be inferred, that this sect existed in the time of Hyrcanus. Accordingly it has been said, that upon the divisions between Hillel, the president of the Sanhedrin, and Shammay the vice-president, about 39 years before Christ, their respective scholars formed two parties, and took different names. Those who adhered to Scripture only were called Caraim, or Scripture, and were followers of Shammay; and those who were zealous for the traditions taught by the Scribes, or Rabbinists, were called Rabbinists, Sadducees, and were followers of Hillel. The Caraites jealously guarded the high antiquity of their principles, as being the followers of Moses and the prophets, in opposition to human tradition; but when the doctrines of the Rabbis were generally adopted among the Jews, the Caraites were considered as schismatics. Scaliger, Volusius, and Spanheim, erroneously, rank the Caraites among the Sabains, Magi, Manichees, and Muffilben. Wolfang, Fabricius, &c. say, the Sadducees and Eicheni were called Caraites, in opposition to the Pharisees; others take them for the doctors of the law, who were mentioned in the gospel: and in favour of this conjecture, has been alleged a tradition preferred in the Jerusalem Talmud, that there wereJerusalem, 480 synagogues, each of which had a separate apartment for the law, and another for the Talmud, or traditionary records: whence it has been inferred, that the Scripture the Rabbis were a party distinct from the Traditionaries. The Scribes, whose office it was to expound the law, from the manner in which they are usually mentioned in the New Testament, in conjunction with the Pharisees, may be concluded to have adopted, in their interpretations, the allegorical method of the Traditionaries and Cabbalists, and therefore to have commonly belonged to their party. Josephus and Philo make no mention of them; whence it is inferred, that they were more modern than either of those authors. Perhaps, this sect was not formed till after the collection of the second part of the Talmud, or the Geonica; or not till after the compiling of the Mishna.

The Caraites themselves pretend to be the remains of the ten tribes led captive by Shalmaneser. Wolius, from the memoirs of Margtheus, a Carate, refers their origin to a massacre among the Jewish doctors, under Alexander Januarius, their king, about one hundred years before Christ: because Simeon, son of Schetchach, and the queen's brother, making their escape into Egypt, there forged his pretended traditions; and, at his return to Jerusalem, published his visions, interpolating the law after his own fancy, and supporting his novelties on the notices which God had given. He communicated by the mouth of Moses, whose deposition he was: he gained many followers; and was opposed by others, who maintained, that all which God had revealed to Moses was written. Hence the Jews became divided into two sects, the Caraites and Traditionaries: among the first, Juda, son of Talbait, distinguished himself: among the latter, Hillel. Wolius reckons not only the Sadducees, but also the Scribes, in the number of Caraites. But the addresses of the Pharisees prevailed against them all; and the number of Caraites decreased: and they long remained in obscurity. At length, about the year of our Lord 750, Anan, a Babylonian Jew, of the race of David, and Sahl his follower, both men of learning, publicly disclaimed the authority of the traditionary doctrines of the Talmud, asserted the Scriptures to be the sole rule of faith, and became heads of the Caraites, or Scripture, who again grew into repute, and increased in numbers. To this later period some have ascribed the rise of the Caraites. See Mafle's Hebrew Grammar, vol. ii. p. 10. But from the history of the Rabbi Anan, who incurred great obloquy from the Pharisaical Rabbis for his heresy, it clearly appears, that he was not the author, but the reformer of the Carata sect. Rabbi Schalomon, in the ninth century, maintained its credit; and among other persons well skilled in the Jewish law, who adhered to it, we may mention Abu-Alpharens, who lived in Palmyra, and
wrote a commentary upon the Pentateuch, which added so much strength to the interest of the Caraites, that the traditional party thought it necessary to implore the affiance of the civil magistrate. Notwithstanding this, however, they continued to hold their assemblies, and published, though in a declining state.

The Caraites are but little known; their works coming only into very few hands, even among the greatest Hebraists. Buxtorf never saw more than one; Selden two; but Mr. Trigland says, he has recovered enough to speak of them with assurance. He affirms, that even after the prophets had ceased, the Jews became divided on the subject of works, and supererogation; some maintaining their necessity from tradition; whilst others, keeping close to the written law, set them aside; and it was from these last that Caraitism commenced. He adds, that after the return from the Babylonian captivity, the observation of the law being to be re-established, there were several practices found proper for that end; and these, once introduced, were looked upon as essential, and appointed by Moses; which was the origin of Pharisaism; as a contrary party, continuing to keep close to the letter, founded Caraitism.

The modern Caraites, Leo of Modena observes, have their synagogues and ceremonies; they pretend to be the sole proper Jews, or observers of the laws of Moses: calling the rest by the term Rabbanim, or followers of the Rabbinus: these hate the Caraites mortally; refusing to ally, or even to converse with them, and treating them as mamzerim, or bastards; because of their rejecting the constitutions of the Rabbinists relating to marriages, repudiations, purifications of women, &c. This aversion is so great, that if a Carait would become a Rabbinit, he would never be received by the other Jews.

The Caraites, however, do not absolutely reject all kinds of traditions; but only such as do not appear well grounded. Selden, who is very express on this point, in his " Ux. or Hebraica," observes, that besides the mere text, they have certain interpretations, which they call heretitical, and which are proper traditions. Their theology only seems to differ from that of the other Jews, in that it is purer and clearer of superstition: they give no credit to the explications of the Talmud, the rabbinical allegories, nor to any constitutions of the Talmud, but what are conformable to the Scripture, and may be drawn by it from just and necessary conclusions.

Peringer observes of the Caraites in Lithuania, that they are very different, both in aspect, language, and manners, from the Rabbinitis, wherewith that country abounds. Their mother tongue is the Turkis; and this they use in their schools and synagogues. In times they resemble the Mahometan Tartars. Their synagogues are placed north and south; and the reason they give for it is, that Shalmanezer brought them northward; so that in praying, to look to Jerusalem, they must turn to the south. He adds, that they admit all the books of the Old Testament; contrary to the opinion of many of the learned, who hold that they reject all but the Pentateuch.

Caleb, a Carait, reduces the difference between them and the Rabbinitis to three points: 1. In that they deny the oral law to come from Moses, and reject the Cabbala. 2. In that they abhor the Talmud. 3. In that they observe the feasts, as the sabbaths, &c. much more rigorously than the rabbins do. To this may be added, that they extend the degrees of affinity, wherein marriage is prohibited, almost to infinity. Their diverging tenets may be summed up in the following particulars: that there is no other rule of faith and worship besides the writings of Moses and the prophets; that all oral traditions, and all allegorical and mythical interpretations of the law are to be rejected; that all material beings were created by an incipient Deity, of whom no resemblance can be found in any thing which he has made; that he knows all things, and exercises a constant providence over all his works; that the human mind is subject to divine influence, but at the same time remains free in its opinions; that true piety takes away guilt: that after death, the soul, if it be worthy, ascends to the intellectual world, to live there for ever; but if it be guilty, it is confined to a state of pain and ignominy: that God alone is to be worshipped; and that faiths are to be freely observed. The present adherents of this fact are said to observe the moral precepts of their law more strictly than their brethren, the Pharisaic Rabbinites, with whom, nevertheless, they are thought unworthy of ecclesiastical communion. Upon the whole, the Caraites are universally reckoned men of the first learning, of the greatest piety, and of the purest morals of the whole nation.


CARALIA, in Ancient Geography, a town of Asia, in Pamphylia.

CARALIS, or CARALES, now Cappad. a town of the island of Sardinia, the capital, according to Florus, pilagado by Grecchius. It was of Phoenician foundation, according to Pausanias, and had the right of Roman citizenship, according to Pliny. Proclo mentions a promontory and gulf of the name of "Carallis."

CARALIS, or CARALLIS, an episcopal town of Asia in Iuliaea, according to Steph. Byz. or, according to the Notitia, in Pamphylia.

CARAMAN, in Geography, a town of France, in the department of the Upper Garonne, and chief place of a canton in the district of Ville-Franche; 5 leagues E.S.E. of Touloufne. The place contains 2,392, and the canton 9,161 inhabitants; the territory includes 1521/2 kilometres and 20 communies.

CARAMANGCE, in Commerce, a drug which comes from China. The Tonicynule value it very much.

CARAMANIA, in Geography, one of the divisions of Asia Minor, now a province of Turkey in Asia, situate on the fothernmost part, and extending from north to south along the Mediterranean coast, which is its southern boundary. It formerly comprehended the ancient countries of Lycia, Pamphylia, Paphloua. Lycaonia, Ifuria, Cilicia. part of Phrygia, Galatia, and Cappadocia. The Turks call the whole province Caraman-bik. Its capital is Satha. This province anciently belonged to the Caramanian princes, and was the last that submitted to the arms of the Ottomans, about the year 1488. Caramania may be divided into Greater and Lesser; the former comprehending all that part which lies to the north of mount Taurus, and the latter that part which lies southward along the coast. The coast of Caramania is for the most part mountainous, and above these high mountains it is not uncommon to see, in clear weather, a very small black cloud, no bigger than a bird. This globe of vapours is subject to great agitation; at first it is very small, then suddenly spreads, contracts, appears and disappears at intervals above the mountain, and changes its form every instant. How calm forever the atmosphere may be, a sudden and violent squall may be expected at the fight of these inflated clouds, which discharge the wind with so much rapidity and vehemence, that if a ship be not prepared to be overtaken by it, she runs a great risk of losing part of her
CARAMANICA, a town of Naples, in the province of Avellino.

CARAMANITA, a province of Terra firma in South America. Living on the river Guana, bounded N. by the district of Carthagena, E. by New Granada, and S. and W. by Popayan, in the audience of Sta. Fe. It is a valley surrounded by high mountains; and the natives extract from its waters very good salt. The capital, of the same name, lies in N. lat. 5% 18'; W. long. 72° 53'.

CARAMBIS, in Ancient Geography, a promontory of Asia Minor, in the most northern part of Galatia, according to Ptolemy, and, according to Sallust, between Heraclea and Phaphagonia; now "Capo Tifello."—Allo, a town of Asia in Phaphagonia.


CARAMBUI, Rhed. Mal. 2. 55. See Jussiensa suffruticosa.

CARAMNASSA, in Geography, a river of Hindoostan, which runs into the Ganges, near Buxar, in the country of Benares.

CARAMOUSSAL, in Naval Architecture, a Turkish vessel, having a very high stern, and rigged nearly like a ketch; that is, it has main and mizen masts and bowprit, but neither foremast nor top-gallant masts.

CARAMUEL De Llorowitz, John, in Biography, was born at Madrid in 1666; and having entered into the Cistercian order, he polished various church preferments in the Low Countries and in Germany, and at length became grand vicar of cardinal Harrach, archbishop of Prague. But suddenly abandoning the church, he allowed the military profession, and in this capacity commanded a company against the Swedes, and acted as engineer and superintendent of the fortifications in Bohemia. He then resumed his former ecclesiastical character; and was successively bishop of Koniggratz in Bohemia, of Campagna in Naples, and of Vigevano in the Milanese, at which latter place he died in 1681. His works are numerous, and indicate a singular genius; and it was said of him, that he had invention in the eighth, or highest degree, eloquence in the fifth, and judgment in the second. His "Essay on Syllogistic Grammar," was published at Brussels in 1642; and his "Daring or Asurdious Grammar," at Frankfort in 1654. He wrote a large volume on the architecture of the temple of Solomon; and published at Vigevano a work, entitled "Apostolicae, i.e. Subtilissimus, vel Nova Dialectico-Metaphysica," distinguished more by subtlety than by clarity and sound sense. He was a irrefragable defender of the doctrine of probability, and also of the infallibility of the pope. His theological writings that have been printed, amount to 7 vols. fol. Nowel. Dict. Hill.

CARAN, in Geography, a river of England, which runs into the Avon at Tewksbury in Gloucestershire.

CARANA, in Ancient Geography, a town of Asia, in the Greater Armenia, which, according to Strabo, gave its name to the province "Caranitis." Steph. Byz. places Carana, which he says was built by the Romans, and also Caranitis, in Galatia.

CARANASI, in Botany, Rumph. Auct. 5. 49. See Capparis clypeata.

CARANDA, a genus established by Gurtner for a kind of palm, described by Rumphius, the fruitation of which is imperfectly known. Spadix and spadix not known. Col. coromandel., three-leaved. Cor. none. Peric. none. Seed superior, naked, pedicelled, airded singly, or two or three together, to the base of the calyx. It is called, in the island of Ceylon, Ghikarande, which means the flanne kharande, to distinguish it from another kharande, or carandas, which Gurtner thinks is a species of Randas; but, in his opinion, even a blind man may see that the seed described by him belongs to the family of palmas. Linnæus refers a Carandas of Rumphius to his Carissa carandas.

CARRANGAS, in Geography, a province and jurisdiction of South America, belonging to the archbishopric of Paita, which begins 20 leagues W. from the city of Paita, and extends above 50 leagues. The climate of this province is so cold that it is barren in corn and grain, &c. but it abounds in cattle. Here are a great number of silver mines constantly worked, among which that called Turco is very remarkable for a fort of ore termed by miners Machacado; the fibre of the silver forming an admirable intertexture with the flanne in which they are contained. Such mines are generally the richest. There are others found in the barren sandy deserts extending towards the west of the South Sea; in which are found, by digging in the sands, detached lumps of silver, not mixed with any ore or flanne, beside which adheres in some parts to the metal. The lumps are called "Papas," because they are dug out of the ground like that root; and they have the appearance of melted silver; which proves that they are formed by fusion. The size and figure of these lumps are very different, weighing from 2 to 60 and 150 marks; these last being a Paris foot in length. Juan and Ullon's Voyage to S. America, by Adams, vol. ii. p. 151.

CARANJA, an island in the Indian sea, near the Corcan coast; 8 leagues S. of Bombay. N. lat. 18° 55'. E. long. 72° 44'.

CARANNA, in Commerce, a hard, brittle, resinous gum, brought from some parts of the West Indies, as Carthagena and New Spain; of an aromatic flavour; and sometimes used in medicine as a cephalic.

The trees from which it runs, are like the palm-tree. When it is fresh, it is white; but as it grows stale, it becomes greyish inclining to green, in which condition it is sent to Europe, where the white is seldom to be met with. It is brought in lumps wrapped up in leaves. To be of the best quality, it must be soft, of a pleasant aromatic smell, and as white as snow. As this gum is very dear, it is seldom sold unadulterated; and other sorts are often substituted in its stead, which have not the same properties. When applied to the head, it has an extraordinary virtue to relieve it from pain; which renders it highly valuable. It produces the same effects in the joints; and is so much esteemed in medicine, that it is become a proverb in pharmacy to say, Whatever the tacanibaca has not cured, the caranna will.

The Americans make a balm of it, which they pretend to be a sovereign remedy for the cure of wounds, and the hemorrhoids or piles.

CARANUS, in Ancient Geography, was, according to Strabo, the port of Aradus, situated in Syria, 7 leagues S.W. of Paltus.

CARANUSCA, a town of Belgic Gaul, occupying, as d'Anville thinks, the spot now called "Garfels," between Metz and Treves.


Gen.
Gen. Ch. Col. perianth four-cleft. Cor. petals four; neotany cylindrical, eight-toothed, bearing the stamens. Stam. eight. Pet. germ superior; style none; stigma large, falcate-shaped. Pericarp capsule one-celled, four-valved. Seeds numerous, angular, of various shapes, of a solid white subflaccid, covered with a reddish, coriaceous skin, united together in an egg-shaped mass, which entirely fills the capsule. La Marec. Willd. with the abundance of La Marec's figure.

Sp. 1. C. squamosa, Aubl. Guian. Supp. p. 14, tab. 387, Lam. Ill. Pl. 701. (Perfornia guareoides, Willd.) "Leaves in numerous pairs, oblong, acuminate." A tree fifty or eighty feet high, three or four feet in diameter. Leaves three feet long, alternate, abruptly winged; leaves large, entire, smooth, sometimes in not less than nineteen pairs. Flowers in compound racemes. A native of Guiana, where a thick bitter oil is expressed from the seeds, with which the inhabitants make themselves as a security against the bite of insects. Excellent meals for ships are made of the trunk. 2. C. melicoca, Lam. Enc. (Granatum littorum five martials, Rumph. Amb. t. 92, tab. 61.) "Leaves in about three pairs, acutely egg-shaped." A tree smaller than the preceding, sometimes producing two or three flews from the same root. Leaves four or five inches long; leaves smooth. Flowers, according to Rumphius, dioecious, yellowish, small, falcate, in compound, axillary racemes. Fruit large, containing from twelve to twenty seeds, similar to those of the preceding species.

As two other genera have been named in honour of Peron, one from New Holland, by Dr. Smith, and another from North America, by Michaux, we have retained the original name given by Aublet, though it must be acknowledged to be exceptionable, on account of its resemblance to Carapa, another of Aublet's genera.

CARAPACE, the thick, solid, firm shell, which covers the turtle or tortoise; and to which adheres those fine transparent scales, which are known under the name of tortoise-shell, of which snuff-boxes and several sorts of inlaid work are made.

CARAPALLA, in Geography, a river of Italy, in the kingdom of Naples, and province of Capitanata, which runs into the Adriatic; 9 miles S. of Manfredonia.

CARAPANATUBA, a river of Guiana, which empties itself into the Amazon, at about one third of a degree of the equator above fort Macapa. By the treaty between France and Portugal, 26th September 1811, it was concluded that the boundaries of French and Portuguese Guiana shall be determined in future by that river. These limits shall follow the course of the river to its source, whence they shall take a direction to the grand chain of mountains which divides the two rivers, and follow the windings of that chain to the point nearest to Rio Branco, between the second and third degree N. of the equator.

CARAPE, in Ancient Geography, a town of AΣα, in the interior part of the Lesser Armenia, towards the mountains. Ptolemy.

CARAPICHEA, in Botany, Aubl. Guian. See CALLICOCCA CARAPICHEA.

CARAPITO, in Geography, a town of Portugal, in the province of Beira; 4 leagues N. of Pincel.

CARAPÓ, in Ichthyology, a fish described by Marcegrave, of which he says there are two kinds, the first having a long and thin body, like a knife-blade; with the back thick, the belly very thin and narrow, and the tail pointed; the second narrower in proportion to its length, and without spots. The head of both is flat and pointed, and the lower jaw runs out a little farther than the upper. The latter character seems to prove that these fishes are varieties of Gymnurus fasciatus, rather than of Gymnurus carapó, as some writers imagine. Gmelin considers the Carapó of Marcegrave as his Gymnurus carapó, which cannot be the fact if we may depend on Marcegrave, the Gmelinian fish of that name having the upper jaw longest instead of the lower one. See Gymnurus carapó, and fasciatus.

CARARA, in Botany. Pfl. Bras. tab. 241. See AMARANTHUS VIRENS.

CARARA, in Commerce, a weight at Leghorn, and in other parts of Italy, used in the sale of wool and cod-fish, equivalent to sixty pounds of that country.

CARAROS, or CARAKUS, in Ancient Geography, a town of Africa Propria, in the vicinity of Targaron.

CARASCHULLI, in Botany. Rheed. Mal. 2. tab. 47. See BURLERIA BAXIFLORA.

CARASCOF, in Geography, a town of Poland, in the patitance of Kiov, 34 miles W. of Bialaerkiew.

CARASOU, a town of Lesser Tartary in the Crimea, once very populous, but burnt by the Russians in 1737.—Alfo, the name of two rivers in Turkey, one of Taurinum, in Caramania, the other in Romania.—Alfo, the name of a lake, being part of the canal which forms the most southerly mouth of the Danube, called by the Turks "Carakimen."

CARASSIUS, in Ichthyology, a species of CYPHRUS, which inhabits the fresh waters of Europe; CYPHRUS of Marf. Danub. supposed by some to be the same with the Rud of English writers. See CYPHRUS CARASSIUS. Obs. Among the old writers carassius was considered as a kind of generic name for the carp, bream, &c.

CARASYRA, in Ancient Geography, one of the forts of Trehe, erected by the emperor Justinian in the province of Rhodope.

CARAT. See Caract.

CARATAE, in Ancient Geography, the name of a people who formed part of the ancient Jace, and who inhabited the coast of the Cappian Sea, on the banks of the Jaxartes.

CARA-TARTARS, in Geography, or black Tartars, a people of Asia; formed by a body of Turks, incorporated by Kult-khan the grandson of Gengis-khan in his army, when he was sent to Iran by Mangou-ches, his brother, emperor of the Moguls. They now occupy the countries of Gara and Touran in Asia.

CARATCHOLIS, a people of Asia in Georgia, N. of mount Caucasus. They are also called "Karakhins" and black Circassians.

CARATING, in Chemistry, a term used to denote the mixture or combination of gold with other metals. Thus, "red carating" expresses the mixture of gold with copper, to distinguish it from the less usual one, made with silver, and denominated "white carating," and also in contradistinction to the "mixed carating" or combination of gold, silver, and copper. The degree of this combination or alloy is expressed by carats and grains. See Caract.

CARATTERE, Ital. character. A musical term, in speaking of a long of two strains; aria di due caratteri; of which the first is generally cantabile, and the second bravura. See Cantabile and Bravura.

CARAVACA, or St. Cruz de Caravaca, in Geography, a town
CARAVAG, a river of Peru in South America, famous for its golden sands.

CARAVAGGIO, in Biography. See Angelo Ameri.

CARAVAN, or Caravanne, in the east, a troop or company of travellers, merchants, and pilgrims, who, for their greater security march in a body through the deserts, and other dangerous places, infected with Arabs and robbers.

The word comes from the Arabic caravan, or caroan; and that from the Persian kerwan, or caroon, negociator, trader, or dealer. Vide. Perif. Itin. Mund. ed. Hyde. p. 67.

There is a chief, or aga, called "caravan-bachi," who commands each caravan, and has under him a number of janizaries, or other forces, sufficient for their defence. The caravans encamp every night near wells, or rivulets known to the guides; and observe a discipline as regular as in war. They chiefly use camels for their vehicles, because of their enduring much fatigue, eating little, and paddling three or four days without drinking.

In this manner trade was carried on, particularly by the nations near the Arabian gulf, from the earliest period to which historical information reaches. See Camel.

The grand fignior gives one fourth part of the revenue to Egypt, to defray the expense of the caravan that goes yearly from Cairo to Mecca, to visit Mahomet's tomb: the devotees, in this caravan, are from 40,000 to 70,000; accompanied with soldiers to protect them from the pillage of the Arabs, and followed with 8 or 9,000 camels loaded with all necessary provisions for so long a passage across deserts.

There are two regular caravans which go yearly to Mecca; the first from Damascus, composed of the pilgrims from Europe and Asia; the second from Cairo, for the Mahometans of Barbary.

Damascus is the grand rendezvous for all the pilgrims from the north of Asia, as Cairo is for those from Africa. Besides the natives of Aleppo who go to Mecca, numbers from Persia and the northern provinces assemble in that city in their way to Damascus, for which place the caravan sets out immediately after the Iftar Bairam. When the caravan sets out from Aleppo, it is conveyed for a few miles by the governor and grandees in procession, and many of the pilgrims being accompanied still farther in their way by their women and kindmen, all is in commotion on the road to Damascus for several days after the Bairam. However, the number of pilgrims who go from Aleppo to Mecca is said to be much less considerable now than formerly. This probably is owing in part to the decaying spirit of Mohammedi, but more to the decline of the trade with Mecca; for it was usual with the merchants, formerly, to make the journey several times in their lives, and the caravans were accustomed to return laden with Indian and Arabian merchandize. After the junction of the caravans from other towns at Aleppo, it proceeds to Damascus; and the number of pilgrims every year is said to amount to from 50 to 60,000; many of them repair hither four months before the time, but the greatest number only at the end of the Ramadam. Damascus then replenishes an immense fair; nothing is to be seen but strangers from all parts of Turkey, and even Persia; and every place is full of camels, horses, mules, and merchandize. At length, after a preparation of some days, this vast multitude set out confederally on their march, under the conduct of the bashaw or pacha of Damascus, and, travelling by the confines of the desert, arrive in 40 days for the festival of Bairam at Mecca; the distance between the two cities being, according to the most moderate estimate, above a thousand miles. As this caravan traverses the country of several independent Arabs, it is necessary to make treaties with the Bedouins, to allow them certain sums of money, for a free passage, and to take them for guides. On this subject frequent disputes occur between the Schiks, of which the pacha avails himself to make a better bargain; but in general the preference is given to the tribe of Sirda, which encamps to the south of Damascus, along the Hauran: the pacha sends to the Schiek a mace, a tent, and a pelisse, to dignify that he takes him as his chief conductor. From this moment it is the Schiek's business to furnish camels at a slanted price; these he hires likewise from his tribe and his allies: the pacha is responsible for no damages, and all losses are on his own account. On an average, 10,000 camels perish yearly; which form a very advantageous article of commerce for the Arabs. It must not be imagined that the sole motive of all the expenses, risks, and fatigues, incurred by the pilgrims, is devotion. Preliminary interest has a considerable share in these expeditions, and, indeed, permission to trade, during the pilgrimage, is granted by the Kuran, chap. ii. p. 23. The caravans afford the means of engrossing every lucrative branch of commerce; and almost all the pilgrims convert it into a matter of speculation. On leaving their own country, they load themselves with merchandize, which they sell on the road; the specie arising from this, added to what they have brought with them, is conveyed to Mecca, where they exchange it for muffles and Indian goods from Malabar and Bengal, the shawls of Cashmire, the shoes of Tonquin, the diamonds of Golconda, the pearls of Bahrain, pepper, and a great quantity of coffee from Yemen. Sometimes the Arabs of the deserts deceive the expectation of the merchant, by pillaging the fraggles, and carrying off detached parties of the caravan. Of the predatory spirit of the Arabs it is a singular proof, that although all their independent tribes are zealous Mahometans, yet they make no scruple of plundering the caravans of pilgrims, while engaged in performing one of the most indispensable duties of their religion. A remarkable instance of this occurred in the year 1777; when 60,000 pilgrims were plundered and dispersed over the desert, a great number destroyed by sword or famine, women reduced to slavery, immense riches lost, and above all, a solemn act of religion sacrilegiously violated. This produced a commotion in the empire, which was not soon forgotten. The plundering Arabs were the allies of Daher, who received them at Cacce, and there permitted them to sell their booty. The Porte, indeed, loaded him with the bitterest reproaches, but he endeavoured to extenuate himself, and to appease the Divan, by sending the white banner of the prophet to Constantinople. In general, however, the pilgrims arrive safe; and in this case their profits are very considerable. At all events they are recompensed in the veneration attach'd to the title of "Hadj," or "Haggy," (pilgrim); and by the pleasure of bustling to their countrymen of the words of the Caaba (See Taaba) and mount Arafat; of magnifying the prodigious crowds of pilgrims, and the number of victims, on the day of the Bairam; and by recounting the dangers and fatigues they have undergone, the extraordinary figure of the Bedouins, the desert without water, and the tomb of the prophet at Medina.

By means of this caravan, Damascus becomes the centre of a very extensive commerce. By Aleppo the merchants of
CARAVAN.

of this city correspond with Armenia, Anatolia, the Dinarbekir, and even with Persia. They send caravans to Cairo, which, following a route, frequented in the time of the patriarchs, take their course by Djefr-Yakoub, Tahbara, Nahous, and Gaza. In return they receive the merchandize of Constantinople and Europe, by way of Saide and Baitout. The home consumption is balanced by silk and cotton stuffs, which are manufactured in the distant countries, and are very well mantled by the dried fruits of their own growth, and freshmade cakes of roses, apricots, and peaches, of which Turkey confines to the amount of about 40,000l. The remainder, paid for by the course of exchange, occasions a considerable circulation of money in cultivo-house duties, and the commission of the merchants. This kind of commerce has existed in these countries from the earliest antiquity. It has flowed through different channels, according to the changes of the government, and other circumstances; but it has everywhere left very apparent traces of the opulence produced by it. See Volney's Travels in Egypt and Syria, vol. ii. Ruffell's Alkppo, vol. ii.

The caravan from Cairo in Egypt is composed, not only of pilgrims from every part of Egypt, but of those that arrive from all the small Mahommetan states on the African coast of the Mediterraneum, from the empire of Morocco, and even from the negro kingdoms on the Atlantic. During the months of April, May, and June, in every year, the rich caravans from the interior of Africa arrive at Cairo; carrying thither a considerable quantity of three species of gums, elephants' teeth, damarins, pan,-os, rich feathers, gold dust, and black slaves; and in return they convey into their own country告le peasants, coral, amber, glads-ware, broad swords, cloths, and all kinds of clothing, which are purposefully made by the manufacturers of Cairo to suit the African taste. When assembled, the caravan consists of 500 to 1,000, and the number of camels employed in carrying water, provisions, and merchandize is still greater. In the month of Ramadan, viz. one month previous to the departure of this caravan from Cairo, begins the fair, vulgarly called 'Maulad (or, the birth of the prophet). Strangers of every nation and religion repair hither to dispose of their merchandize. At this fair, European merchandize is the most required; and of coin the sequin of Venice is preferred. The pilgrims purchase them at the highest price, as it is the coin from which they derive the greatest profit. The women are not less anxious to obtain them than the men, for the purpose of ornamenting the head and bosom. The journey, which, in going from Cairo, and returning hither, is not completed in less than 100 days, is performed wholly by land; and as the route lies mostly through sandy deserts, and barren uninhabited wilds, which seldom afford any refreshment, and where often no sources of water can be found, the pilgrims always undergo much fatigue, and sometimes must endure incredible hardships. Of this caravan an early and good description is published by Hakluyt, vol. ii. p. 205, &c. Maillet (Decript. de l'Egypt, part ii. p. 121, &c.) has entered into a curious and minute detail with regard to it; and Pococke (vol. i. pp. 188, 261, &c.) has given a route, together with the length of each day's march, which he received from a person who had been 14 times at Mecca. Upon the return of the caravan to Cairo, another fair begins, more sumptuous and rich than that already mentioned; where strangers barter for new commodities, and part with those which they had not been able to fall at the departure of the caravan. Thus the commerce of Cairo extends by land as far as Mecca in consequence of this yearly pilgrimage, and also into the interior of Africa by the caravans of pilgrims.

Great as these caravans are, we must not suppose that all the pilgrims who visit Mecca belong to them. Such consider-
of Sibbeel, and at the close of the following day they arrive at the town of Angela. From Angela, which is subject to Tripoli, and famous for the abundance and excellent quality of its dates, they proceed in one day to the village of Gui Xarra, and another brings them to the long ascent of the mountain of Gerdoebah, Descending from this height, where they procure, during five days of their passage over it, a scanty supply of unpalatable water, they enter the narrow plain of Geggibib, which is sandy and uninhabited, but fertile in dates, annually gathered by the people of Dana, a town dependent on Tripoli, and situate on the coast at the distance of eight days' journey from Geggibib. After a march of three days they are conducted to a defolate mountain called Bufeiena, that furnishes only water; and in three days more they enter the dominions of the independent republic of See-wah. From See-wah, the caravan proceeds in a single day to the miserable village of Umfeetr, situate at the foot of the mountainous defect of le Morga, whence, after seven days, it arrives at the hill of Huaddy l'Otrion, distinguished by a small convent of three Christian monks, under the protection of Cairo. By these monks the travellers are hospitably entertained; and thence they continue their course, and on the fifth day reach the city of Cairo, from whence, at the proper season, they pursue their route to Mecca.

The other two caravans from Sennaar and For, are extremely various in their motions; sometimes not appearing in Egypt for the space of two or even three years, and sometimes two or more distinct caravans arriving in the same year. The perpetual changes in their several governments, and the caprices of their despots, are in a great degree the occasion of this irregularity. The road also between these two places and Cairo is often infested by bodies of independent Arabs, as that of Sennaar by the Abadé and Shailké, and that of For by the Cubba-Beeth and Bedaâit.

The departure of a caravan from Dar-Fur forms an important event: it engages the attention of the whole country for a time, and even serves as a kind of chronological epocha. The period of their arrival at Cairo is as uncertain as that of their departure; for they travel indifferently either in winter or summer. The journey from Alfal to Sennaar requires much less time than that from Alfal to Dar-Fur. The roads of the defect are not distinguishable by any permanent marks; and as they are perfectly ignorant of the camps, and so imperfectly acquainted with the fixed roads, they are obliged to a loaf for the road, and sometimes deviate into dangerous paths. In passing from Dar-Fur to Egypt, they consider 2000 camels and 1000 slaves a large caravan. Camels are indispensable for these long and fatiguing journeys, and therefore they are reared by the Arabs and Jelabs with great care: nevertheless, the merchant pays nearly as much for the camels to carry his merchandise as he did for the commodities themselves. Horses are little used by the Jelabs: they generally furnish themselves with Egyptian asses, which are afterwards sold at Soudan at an advanced price. The customary food of the drivers and servants of the caravan consists of the milk of the camel, with a few dates, together with the meal of barley, or of Indian corn, which is sometimes seasoned with oil, to which the merchant superadds, for his own use, the dried flesh of the camel, or of sheep, and concludes his repast with coffee. Water is drawn from the wells, when they occur, in leather buckets, that form a part of the travelling equipage of the caravan, and is carried in the skins of goats, through which, however, though tarred both within and without, it is often exhaled by the heat of the noon-day sun. A very easy mode of conveyance is provided for the women and children, and for persons either ill or infirm. Six or eight camels are yoked together in a row, and several tent poles are placed in parallel lines upon their backs: these are covered with carpets, and bags of corn are superadded to bring the floor to a level, as well as to soften the hardships of the camel's movement: other carpets are then spread, and the traveller sits or lies down with as much convenience as if he reft on a couch. The provisions of the Dar-Fur caravan are scanty and indifferent, nor are any of them furnished with dried meat as is common with the Fuzzaners. Few use coffee and tobacco, and the rest content themselves with a leathern bag of flour, another of bread baked hard, a leathern vessel of honey or treacle, and another of butter. In travelling from Dar-Fur to Egypt, another article is much used, especially for the females, which is the grain called millet. Of this they take a quantity after it has been coarsely ground, and caufing it to undergo a flight fermentation, they make of it a paste. When they use it they add water, and it becomes a tolerably palatable food, allaying thirst whilst it affuages hunger. Experienced travellers, among every ten camels laden with merchandise, charge one with beans, and straw chopped small, which, sparingly given, serve them during the greater part of the journey. Water, instead of being conveyed in goat skins, the evaporation of which no fluf can entirely prevent, is carried in ox hides, which the Jelabs, on their march from Soudan to Egypt, form into capacious sacks, and properly flaven with tar or oil. A pair of these is a camel's load. The "Cubba-Beeth" and the "Bedaâit," when they make any attempt on the caravan, commonly flew themselves between Legheba and Bir-el-Malka. But this road is so ill provided with any kind of accommodation for man or beast, that neither the wandering tribes, nor the ferocious animals which infest other parts of the continent, are commonly found there. The Egyptians and other whites, therefore, though they commonly carry fire-arms with them from the North, generally take advantage of the market of For, and return without any. The natives of Soudan are furnished with a light spear, the head of which is made of unhardened iron of their country. They have also a shield about three feet long, and 1 or 2 foot broad, composed of the hide of the elephant, or hippopotamus, very simple in its construction. No regular caravan of Hadgis leaves Dar-Fur, but a number of the natives make their way to Mecca, either with the caravan of merchants trading to Egypt, or by way of Sunkem or Jidda.

Upon the whole we may observe, that independent of these caravans that are formed from religious motives, most of the inland commerce of the East has been for many ages carried on by means of caravans. In former times, caravans traversed the whole latitude of Asia in 243 days, from the Chinef Ocean to the sea-coast of Syria. Silk was immediately delivered to the Romans by the Persian merchants, who frequented the fairs of Armenia and Nibfis; but this trade, which, in the intervals of truce, was oppressed by avarice and jealousy, was totally interrupted by the long wars of the rival monarchies. However, the cities of Samarcand and Bokhara were advantageously situated for the exchange of the various productions of Asia; and their merchants purchased from the Chinef the raw or manufactured silk, which they transported into Persia for the use of the Roman empire. In the vain capital of China, the Sogdian caravans were entertained as the suppliant embassies of tributary kingdoms; and if they returned in safety, the bold adventurer was rewarded with exorbitant gain. But the difficult and perilous march from Samarcand to the dirty town of Shent, could not be performed in less than 60, 80, or 100 days. As soon as they had passed the Jaxartes they entered...
the defect; and the wandering horde, unless they are restrained by armies and garrisons, have always considered the citizen and the traveller as the objects of lawful rapine. In order to escape the Tartar robbers, and the tyrants of Persia, the folk caravans explored a more southern road; they traversed the mountains of Tabib, defended the streams of the Guanges and the Indus, or expected with patience, in the ports of Guran and Malabar, the annual fleets of the Red. But the dangers of the desert were found less intolerable than toil, hunger, and the lobs of time; and therefore the attempt was seldom renewed; and the only European who has passed that unfrequented way, applauds his own diligence, that in nine months after his departure from Pekin, he reached the mouth of the Indus.

The same intercourse which was anciently kept up between the provinces in the north of Asia with Hindostan and Chins, still subsists. Amongst all the numerous tribes of Tartars, the demand for the productions of these two countries is very considerable. In order to supply them, caravans set out annually from Bokhor, Samarcaund, Thibet, and several other places, and return with large cargoes of Indian and Chinese goods. But the trade carried on between Ruflia and China, in this part of Asia, is by far the most extensive and best known. Some concern of this kind has probably been kept up between them from the earliest period; but it is greatly increased after the interior parts of Ruflia were rendered more accessible by the conquests of Zenghis Khan, and Tamerlane. The commercial nations of Europe were to well acquainted with the mode of carrying on this trade, that soon after the Portuguese had opened the communication with the East, by the Cape of Good Hope, an attempt was made, in order to diminish the advantages which they derived from this discovery, to prevail on the Busians to convey Indian and Chinese commodities through the whole extent of their empire, partly by land carriage, and partly by means of navigable rivers, to furnish the part of the Baltic, from which they might be distributed through every part of Europe. This scheme was rendered practicable by the conquests of Ivan Baflowlitz, and the genius of Peter the Great. Though the capitals of the two empires were situated at the immense distance of 6,758 miles from each other, and the route lay for above 400 miles through uninhabited desert, caravans travelled from the one to the other. But though it had been flippulated, when this intercourse was established, that the number of persons in each caravan should not exceed 200, and though they were shut up within the walls of a caravanserai during the short time they were suffered to remain in Pekin, and were allowed to deal only with a few merchants, to whom a monopoly of the trade with them had been granted; yet, notwithstanding all these restraints and precautions, the jealous vigilance with which the Busian government excludes foreigners from a free intercourse with its subjects was alarmed, and the admission of the Ruflian caravans into the empire was soon prohibited. After various negotiations, it was agreed, that two towns should be built almost contiguous, on the boundaries of the two provinces, Kiachta inhabited by Ruflians, and Mamafelin by the Busians. To these all the marketable productions of their respective countries are brought by the subjects of each empire; and the furs, the linen and woollen cloth, the leather, glass, &c. of Russia, are exchanged for the flax, the cotton, the tea, the rice, the toys, &c. of China. See Russia and China.

M. Bougon, geographer of the duke of Lorraine, has given a treatise of the caravans of merchants in Asia, wherein he shows of what they are composed; how many forts there are; the several uses of the different forts of animals in them; the price given for them; the officers and men appointed to conduct them, and the pay of each; with their manner of marching, halting, lighting, eating, &c.

In the heavy caravans, to five hundred elephants there are a thousand drudgeries, and at least two thousand horses, elected by four thousand caravans. Two men are required to lead each elephant; five to three drudgeries; and seven to twelve camels. Such a number of servants joined with the officers and pagers, the number whereof is not limited, renders the body very formidable; the pagans, indeed, are not obliged to light, but in case they revolt, provision will scarcely be allowed them afterwards, even for their money.

As few of the Arab princes have any other substance than what they can get by pillage, they keep continually spies on foot to give them intelligence of the departure and motions of caravans, which they frequently attack with inferior forces; in case of repulse, they come to an accommodation; but if the caravan be beaten, it is absolutely plundered, and the whole guard made slaves; though more indulgence is shown to strangers. The taking of a single caravan sometimes enriches a prince for ever.

The profits to be made in a caravan, during its march, are often incredible; Mr. Bougon gives instances where, by repeated bargains and exchanges, a person has made twenty thousand crowns out of a single gold watch, and thirty louis d'ors.

Any dealer is at liberty to form a company, in order to make a caravan. He in whose name it is raised, is considered as the caravan-bachelor, or chief of the caravan, unless he appoint some other in his place. If there be several merchants equally concerned, they elect a caravan-bachelor; after which they appoint officers to conduct the caravan, and decide all controversies which may arise during the journey.

In the East, days' journeys are distinguished in journeys of horde-caravans, and caravans of camels; those of horses are equal to two of camels. Mr. Remnel, in an ingenious dissertation on the rate of travelling, as performed by camels, (Phil. Trans. vol. lviii. p. 270-1457) he has shown how to apply the hourly rate of the camel's travelling by caravans as an useful scale to the geography of Africa; and he will also serve for the estimate of distances and of time, in other countries, where camels and caravans are in use. He distinguishes caravans into heavy and light. Camels loaded with from 500 to 600 pounds, which are a camel's load, form what is called the heavy caravan; and light caravans, on the contrary, are applied to camels under a moderate load, or perhaps little more than half-loaded. Having settled the mean daily rate of the heavy caravan at 18.4 British miles, reckoning 24 miles for each hour, and 10.25, if taken at 2.50, and the mean rate of the light caravan, 22.17 miles, at 2 1/2 and 22.7 at 2.50; he observes, that, in order to apply the scale with effect to the African geography, it is necessary to state the number of days that the caravans usually halt on the road. From various inquiries he concludes that, at an average, one halt must be allowed to 12 1/2 travelling days: and this, of course, must be deducted from the aggregate of the distance; or should it be averaged on each day, the heavy caravan day must be reckoned at 17.14 miles instead of 18.64, and that of the light caravan at 20.4, instead of 22.17, when the hourly rate is taken at 2 1/2 miles. It further remains to be stated from the proportion that the road distance bore to the direct distance, what length in direct distance, and in geographical miles, may be allowed for each day, for the heavy caravan, on the lengths of journey, and over tracts of country.
similar to the route of Mr. Carmichael from which the
ultimate is made. It appears that on the 28 days between
Aleppo and Raekama (opposite Mejid Ali) the mean length
of the day's journey in direct distance is about 154 geo-
graphical miles; and on the whole 45 days between Alpeko
and Bufforah, 15.8 such miles. If allowance be made for
halts, there will require a deduction of 8 parts in 100 to be
made from the gross amount of the whole journey, when
applied to the purposes of geography. Mr. Carmichael
counted the caravans' steps in order to ascertain a scale of
distance. Mr. Holfard also did the same, and measured the
length of them on the ground. The former gentleman
counted the double steps, or rather the return of the same
foot of a camel on which he rode, for an hour together on
20 different days, at such times as admitted of the greatest
variation in the rate of motion. He found the greatest num-
ber of steps to be 2420, the least 2065; and the mean of
the whole 20 hours was 2200. The latter gentleman re-
knoned the greatest 2240, least 2060; mean 2150. They
both report the double step to be 55 feet. The result of
the former account is 2.29 British miles per hour; of the
latter 2.24: each allowed his distance accordingly in his
journal. But Mr. Kennel observes, that their computed
distances fall very short of the truth. The error probably
originated from their measuring too small a number of steps
on the ground as the foundation of their calculation. The
reason of the great variation in the number of paces, in a
given time, is the plenty or scarcity of the desert thrubs,
on which the camels feed as they go on; and then such exper-
iments become useless unless the quality of the desert were
described in every part of it.

Some have reckoned five forts of caravans, viz.
Caravan, heavy, composed of elephants, dromedaries,
camels, and horses.
Caravan, light, in which there are but few elephants.
Caravan, ordinary, in which there are no ele-
phants.

Caravan of horses, that in which there are neither camels
nor dromedaries, but only horses.
Caravans, fea. companies of merchant vessels, loaded
with goods, and convoyed by ships of war. Such are those
which proceed from Constantinople to Alexandria.

Caravan is also an appellation given to the voyages,
or campaigns, which the knights of Malta are obliged to make
at sea against the Turks and corsairs, in order to arrive at
the commanderies and dignities of the order. They are thus
called, because the knights have frequently seized the
Caravan going from Alexandria to Constantinople.

Caravanier, a person who leads the camels and
other beasts of burden used in the caravans of the East.

Caravansera, a large public building, or inn,
deigned to receive and lodge the caravans.
The word comes from the Arabic carawan, or Persian
karwan or cavan, a caravan, and ferai, a large house.

Of these caravanseras, or as Chardin calls them, caravan-
ferais, there are a great number throughout the east; erected
out of the charity and magnificence of the princes, &c. of
the several countries, for the accommodation of travellers.
They are called by the Turks "houses;" and are situat-
esometimes in the towns and villages; sometimes at conve-
inent distances upon the road.

Theofe of Schiras and Caibin in Persia, are paid to have
cost sixty thousand crowns each. They are open to people
of all religions and countries, without any questions asked
or any money required.

The caravanseras are usually huge square buildings, with
a spacious court in the middle of them. They are encoun-
tered with galleries and arches, under which runs a kind
of banquette, or elevation, some feet high, where travellers
rest themselves, and make their lodgings as well as they can;
their baggage and the beams that carry them being fastened
to the foot of the banquette. Over the gate, there
is frequently a sort of little chambers, which the cara-
vanferais let out at a very dear rate to such as will be
retired.

Though the caravanseras serve in lieu of inns, yet there is
this essential difference between them and our inns, that
the traveller finds nothing at all in the caravansera either
for himself, or his cattle; but must carry all his provisions
and necessaries with him. They are chiefly built in dry barren
defert places; and are generally furnished with water from
the garden, and at a vast expense; there being no ca-
rvansera without its well of water. There are several of
them in cities; where they serve not only as inns, but as
shops, warehousc, and even exchanges.

There are some caravanseras where most things may
be had for money; and as the profits of these are con-
siderable, the magistrates of the cities to whose juris-
tration they belong, take care to florce them well; they
have an inspector who fixes the price of lodging, and
attracts trade. Such well-furnished resting places are
not to be found in India, and even the most hospitable
guesthouses cannot compare with them for the care of
the host, or keeper of the caravansera, and promised at his
return to pay him for whatever things the distressed traveller
required, and which the keeper furnished him with. Luke
xiii. 35.

There are few cities in the east without their carav-
anseras; especially within the dominions of the great Mogul.
Those of Constaninople, Ispahan, and Agra, the capitals
of these three empires, are distinguished for their magni-
culence and commodiousness. The caravanseras of Schiras
and Caibin, considerable cities of Persia, are also in high
reputation, and little inferior to those of the capital.

In Turkey, none but the grand signior's mother and fift,
with the vintners and bakhouns who have been in these
cities, are allowed to build a caravansera.

Caravansersaskier, the director, reward, or
intendant of a caravansera.

At Ispahan there are caravanseras in manner of halls
or exchanges, where goods are laid up, and exposed to view;
for which the caravansersaskier is accountable, in considera-
tion of a certain fee.

Caravel, the name of a vessel formerly used by the
Spaniards and Portuguese; the masts were inclined, in place
of being upright as usual, with triangular sails. Vessels of
this description failed fast, and would lie near the wind.

Caravel is also the name of a small vessel employed on
the coast of France in the herring fishery; and these are
commonly from twenty-five to thirty tons burden. French
vessels in the same employment in the British channel are
called Tingquarts; these are in general from twelve to fif-
teen tons burden.

Caravella, in Zoology, a species of Medusa de-
scribed in Sloane's History of Jamaica. See Medusa
Caracola.

Caraven, in Geography, a small island in the Grecian
Archipelago. N. lat. 35° 53'. E. long. 23° 36'.

Caravilla, a town of Naples, in the country of
Molise; 12 miles N.W. of Molise.

Caravan, in Ichthyology, the name of a small Brazil-
ian fish described by old writers as being of a fine bright
red colour, with innumerable black spots all over it. The exact
species
species is uncertain, but it appears to be that of the Laurus genus.

CARAUSIUS, in Biography, a native of Menapia or Maritime Flanders, who usurped the empire in Britain in the third century. According to Dr. Stukeley (Hist. of Carausius) he was a native of St. David's, and a prince of the blond royal of Britain. Although sprung from the meanest origin "villainous nature," according to the expression of Eutropius, he advanced himself by his naval skill, as a pilot, and by his experience and valour in maritime expeditions, to stations of trust and service, under Probus and his successors. Having by the display of his talents ingratiated himself with Maximian, this emperor employed him in conducting an enterprise against the Franks and Saxons, who by their piracies had rendered the navigation of the seas impracticable. With this view he was appointed to the command of a squadron, assembled at Gessoracium or Boulogne. Carausius availed himself of the opportunity which this office of trust afforded him for acquiring, by various captures of vessels richly laden with spoil, ample treasures; which he appropriated to his own use. Maximian, enraged by his treacherous and fraudulent conduct, determined to put him to death without trial. The crafty Carausius foreknew and prevented the severity of the emperor. By his liberality he had attached to his interest the fleet which he commanded; and from the port of Boulogne he sailed over to Britain; where, perfusing the legion, and the auxiliaries that guarded the island, to join his party, he boldly assumed the imperial purple, and the title of Augustus, and sat at defiance the justice and the arms of his injured sovereign. This event happened, during the joint empire of Diocletian and Maximian, A.D. 286. In order to secure his usurpation he augmented his fleet, attached to his cause by a variety of artful methods the Franks and Saxons, and whilst he defended the frontiers of his dominions against the Calvinoids of the North, invited from the continent a great number of skillful artists, and displayed, in various coins which are still extant, his taste and opulence. He still preferred the possession of Boulogne and the adjacent country. His fleets rode triumphant in the channel, commanded the mouths of the Saine and of the Rhine, ravaged the coasts of the ocean, and diffused beyond the columns of Hercules the terror of his name. Under his command, Britain defined in a future age to obtain the empire of the sea, already assumed its natural and respectable elevation of a maritime power. As he had besieged the fleet of Boulogne, he had deprived his master of the means of pursuit and revenge. After a disappoointed effort by a new armament, confining of imperial troops unaccustomed to the sea, Diocletian and his colleague resigned to Carausius the sovereignty of Britain, and reluctantly admitted their perfidious servant to a participation of the imperial honours. His civil government, whilst it lasted, was oppressive and tyrannical. He held the people in a state of perfect subjugation, and at the same time indulged his own passions and those of his mercenaries, upon whom he depended for support, without restraint and limitation. At length, however, the association of the two Caesars restored new vigour to the Roman arms; and the conduct of the British war was committed to the brave Constantius. His first enterprise was directed against Boulogne, which after an obstinate defence surrendered, A.D. 292; and thus a considerable part of the naval strength of Carausius fell into the hands of the besiegers. During the three years which Constantius employed in preparing a fleet adequate to the conquest of Britain, he feared the coast of Gaul, invaded the country of the Franks, and deprived the usurper of the assistance of these powerful allies. Before these preparations were

flattened, Constantius received information of the death of the tyrant, who was murdered, A.D. 293 (says Gibbon) or A.D. 292 (Blair's Tables) by his chief minister Allectus. See AllctiUs. Ceasar's Rom. Emp. vol. ix. Gibbon's Hist. vol. u.

CARAWAAN WANG Point, in Geography, the east point of the bay of Bataan in the island of Jav.

CARAWAY, in Botany. See Carvi carui.

CARAVAY, in Agriculture. A plant sometimes cultivated for the feed. It is a sort of crop much cultivated in Ethiopia on rich old shies of a thriving adaptable or hoary nature, in low situations. It is sometimes sown with coriander and teasel, and harvested the second year at the expense of four tillings an acre. It is commonly threshed upon a cloth in the field, being very apt to fall in gathering, which is done the beginning of July. It commonly requires two good sowings; one in April, the other in the beginning of June. The produce of this crop has often been very great, even as much as twenty hundred weight per acre, which has always a market in London, but sometimes as low as 12s. and frequently as high as 50s. on an average, 24s. or 26s. per hundred weight. It does not perfect its seed till the second or third year, when the land is fit to be ploughed up for what. For this crop the land should be prepared by two or more ploughings, and have a portion of manure applied where poor. See Carus.


CARAZOWNY, in Geography, a river on the east coast of South America, between the river Caruaya to the E.S.E. and Urache to the W.N.W. It large and navigable; but visited chiefly by a few Dutch ships, who come hither to load a kind of dyers' wood. See CARACA, or CARACA, in Ancient Geography, a town of Alia, in Parapamisia. Ptolemy.


CARBANIA, a small island of the Mediterranean, between Sardinia and the continent of Italy. Pomp. Mela. Some have thought that it is the Barren of Pliny, and the modern Cardeli.

CAREANTORIGUM, a town in the northern part of Britain, which, according to Ptolemy, belonged to the Selgove. Horshay places it at Bardana on the river Nith, above Dumfries, and Camden at Carlavock, below it; and it was therefore probably situated where Dumfries now stands, or a little below it. The name seems to be derived from "Cer vant o riy," a town near the mouth of a river. Baxter places it at Melroes.

CARBASA Caryfina, a term used by many of the ancient writers to express pieces of cloth made of the linum incompositum, or ablotos stone, which being found plentifully about Caryllium, was thence called by the name of the place. Paulusianis calls it linum Carphylum; for the same sort of reason; Carphus, a town in the island of Cyprus, being a place famous for affording large quantities of the stone in its neighbourhood.

CARBATTA, in Ancient Geography, a place of Italy in Liguria, at a small distance south of the Pads, or Po.

CARBENSIS aqua, in the Materia Medica, the name of a mineral water of Germany, of which Hoffman from Petraeus has given the following account. All about the place of its origin, and along the canals through which it passes, it deposits an earthy and ferruginous matter, which concretes into a stony hardnes. When any alkaline liquor, whether fixed or volatile, is added to these waters, they become turbid, and precipitate a whitish earthy matter to the bottom
bottom of the vessel; after the evaporation of the water they leave a fulminum, and an alkaline earth; two quarts of them yield two quinques and ten grains of the earth, and twelve grains of the salt. If it be kept for any time in a glass, or earthen vessel, it deposits a sediment of a yellow ochraceous earthy matter, and when immediately taken from the spring, it changes to a bluish brown colour, on being mixed with galls. It contains a very large portion of a soluble mineral spirit; for if a long-necked vessel be filled half full with it, and the orifice flopped with the thumb, the whole, on a little shaking, emits a fume from the top; and when the thumb is taken off, the water seeps out to several feet distance. It makes an effervegence on mixing oil of vitriol with it; but this lasts but a very little time. From the whole, it seems to contain a large quantity of calcareous earth, and some small portion of ferruginous matter; whence it purges both by stool and urine, though mildly the latter way: the former operation, which is pretty connivent, is owing to this alkaline earth meeting with an acid in the prima vis, and being by it changed into a bitter purging salt, of the nature of Gluher's.

CARBEQUI, or Alper of copper, a coin which is current in the province of Georgia in Asia; particularly at Teffis, the capital. Forty carbequis are equal to the "abagi," and ten carbequis to the "chomari."

CARBERRY, in Agriculture, a name applied, in some places, to the gooseberry.

CARBERRY, in Geography, the name of a large barony in the S.W. of the county of Cork, province of Munster, Ireland. The district of this name formerly included some of the adjoining baronies, and is supposed to have been so called from an Irish prince who governed it. It is still the largest barony in Ireland, containing 39 parishes, and 156,321 Irish plantation acres, which is more than many counties. It has, therefore, been found convenient, in managing county business, to divide it into East and West Carbery. It is a very wild, mountainous, unimproved country, with a bold rocky coast, and many harbours.

A Latin poem of dean Swift's, called "Carberic rupes," was written in 1724, whilst on a visit to a clergyman in this barony. Dr. Smith, who made more than once the same little voyage along the coast which the dean had done, observes that the dean's descriptions were as just as his numbers were beautiful. The poem, and a translation of it by Dr. Dunkin, may both be seen in Smith's History of Cork, from which this article is principally taken. In some parts of Carbery the linen manufacture is successfully carried on, especially about Dunmanway and Cloghmacnulty. Carbery, or Carbury, is also the name of two other baronies, one in the county of Sligo, and the other in the county of Kildare.

CARBERY, a small island in Dunmanus bay, county of Cork, Ireland, which shelters vessels from westerly winds, but has firths in its neighbourhood, which require attention to guard against. It is sometimes called Ileis Carbery. N. lat. 51° 31'. W. long. 9° 34'. M. Kenzie, Beaufort.

CARES, St. Jacques, a town of Martinico, in the West Indies. N. lat. 14° 35'. W. long. 61° 10'.

CARBI, in Ancient Geography, a people of Arabia Felix, according to Diodorus Siculus.

CARBIA, a place in the island of Sardina, on the route from Tribule to Sulci. Anton. Itin.

CARBINA, a place of Italy in Japygia, mentioned by Athenæus, who says that it was taken by the Tar- rentines.

CARBINIA, in Geography, a town of the department of Lianone (island of Corfica), and chief place of a canton in the district of Sartene; 5 miles E. of Tallano. The canton contains 2,066 inhabitants.

CARIO aquaticus, in Ornithology. See Petreornus Carbo, the Corvonzor.

CARBON, in Chemistry. 5. Of Carbon.

This substance abounds largely in all vegetable and animal bodies, as well as in the mineral kingdom, yet it is of very rare occurrence in a state of absolute purity. When uncombined with any foreign matter, it is transparent, colourless, intensely hard, and infusible; and, both on account of its beauty and value, is placed at the head of the gems under its commercial and mineralogical name DIAMOND.

Diamond was formerly supposed to be incombustible, and the first hint at its real nature was given by Newton. This philosopher having observed that inflammable bodies posse a, in proportion to their density, a greater power of refracting the rays of light than any other substances, was induced to rank the diamond among them, on account of the eminent degree in which it possessed this property. This conjecture was verified, in 1791, by the members of the Academy del Cimento at Florence, who confirmed several diamonds by placing them in the focus of a lens. Francis I. emperor of Germany, afterwards witnessed the destruction of several more by the heat of a furnace. These experiments were repeated by Macquer, Ronelle, Dareet, and Ceder, who ascertained, that by the concurring action of air and heat, diamond was not only evaporated, but actually burnt with flame; they also proved that when the air was excluded the highest heat of a furnace produced little or no effect on this substance.

In 1772, an experiment was made by Lavoisier, which may be considered as the first attempt to effect a chemical analysis of diamond. He burnt a few grains of this substance in a jar of common air, confined over mercury, by means of a very powerful lens, and found that the pure part of the air had disappeared, as well as a considerable proportion of the diamond, and that the residual air abounded with carboenic acid: repeating the same process only with the substitution of an equal weight of highly burnt charcoal, he found precisely analogous effects to take place, and therefore concluded that diamond and charcoal in their chemical essence were very similar to each other. In 1785, M. Moreau discovered that diamond, when dropped into melted nitre, burns like charcoal, and without leaving any residue. This fact suggested to Mr. Tennent a method of analysing diamond, which was effected with complete success. Into a gold tube, cieded at one end, and terminating at the other in a curved glass tube, were put a quarter of an ounce of nitre and 2 ½ grains of diamonds; the tube was then kept at a full red heat for an hour and a half, and when its contents were afterwards examined, the diamonds were found to have entirely disappeared, and the nitre was changed into sub-carbonat of potash; to a solution of this salt marlet of lime was added, and thus the carbamic acid was transferred to the lime: from this carbamic acid the carbonic acid was expelled by means of the muriatic acid, and was found to amount to 9.67 grains. Hence 27.6 parts of diamond and 72.4 of oxygen constitute 100 of carboenic acid. But according to Lavoisier, 28 parts of charcoal, and 72 of oxygen constitute 100 of carboenic acid; therefore diamond and pure charcoal may be considered as chemically the same.

Morveau has since endeavoured to invalidate the experiment of Mr. Tennent, and to show that diamond is pure carbon and that charcoal is an oxyd of carbon, but his experiment is so manifestly incorrect as to merit no sort of confidence.

A further proof of the analogy between charcoal and diamond is furnished by an ingenious experiment of Cluets', in which
which some pure bar iron being exposed to a high heat, in contact with diamond, this latter substance was found to have disappeared, and the iron to be converted into lead.

But though diamond is the purest form of carbon, yet its high value, its hardness, and density, forbid it to be used in ordinary household purposes; all the succeeding facts, therefore, relate to that less pure kind of carbon, which is obtained by expounding common charcoal, or, still better, lamp-black, to a high heat in close vessels.

Carbon, or prepared charcoal, is an excellent conductor of galvanism and electricity, but transmits caloric with very great difficulty; a short piece may be held by one end while it is heated red at the other, without conveying any notable warmth to the hand.

It is insoluble in water, and even the combined action of air and water produces hardly any perceptible effect upon it; hence it is that flakes of wood that are charred on the outside will last much longer without rotting than the soundest timber that has not undergone this preparation.

Charcoal is not fusible by the greatest heat that can be applied; if exposed to a very high temperature in close vessels it loses little or nothing of its weight, but shrinks in size, and becomes proportionally more compact, dense, and amoriorous, and acquires a deep velvet black colour. But though charcoal is unalterable by mere heat, and yet when heated red in the open air, it speedily undergoes combustion, and is converted into Carbonic Acid; pure oxygen gas produces, as might be expected, a much more powerful effect on this substance than atmospheric air does; a piece of charcoal barely heated at one end to redness and plunged into this gas, immediately burns with an intensely white glow, and is rapidly changed into carbine acid.

Water, although it is, as we have already mentioned, incapable of dissolving carbon, is yet very obstinately retained by it, partly on account of its porous texture, and in part probably on account of a strong mutual affinity subsisting between them. When, however, charcoal is red hot, or nearly so, it decomposes any water with which it may happen to be in contact, and unites with both the elements of this substance; producing with the oxygenous bafe, according as this is added to saturation or not, carbonic acid and carbonaceous oxide; and with the hydrogenous bafe forming a heavy inflammable air, called carburretted hydrogen or hydrocarbon.

Newly prepared charcoal is capable of absorbing various gasses, with remarkable facility, and in considerable proportions. This fact had been observed by Fontana, Lamethije, Priestley, Scheele, and Morveau, but the first important series of experiments on this subject was published by Moretto, since which time Meissr. Roupee and Van Noorden of Rotterdam have made a considerable and very valuable addition of facts on this curious subject. The charcoal for the experiment being highly ignited in an open fire, to expel all the moisture and gaseous substances which it may contain, is quickly removed, and extinguished by being plunged under mercury, or inclosed in an air-tight metallic box; when quite cool it produces the following effect on the various gasses.

One part of charcoal is capable of absorbing three times its bulk of atmospheric air in four or five hours; of oxygen gas there is absorbed, at first rapidly, and afterwards more slowly, 28 times the bulk of the charcoal. Azot and hydrogen are taken up inflamnately, but only in the proportion of 1.6 of the former, and 1.8 of the latter. Of nitrous gas 8.5 parts are very slowly, and of carbonic acid 14.3 parts are very rapidly absorbed. The gasses thus taken up undergo no change except of form, nor are the residues at all altered, and they may be all again separated from the charcoal by distillation, at the temperature of boiling water.

If charcoal saturated with hydrogen in the way described is introdiced into oxygen gas, or even into atmospheric air, a considerable absorption of the oxygen takes place, and at the same time the temperature rises to about 150°. The result is the same if the experiment is inverted, that is, if charcoal charged with oxygen is introdiced into hydrogen gas. Charcoal saturated with hydrogen is even capable of decomposing nitrous gas, the oxygen being absorbed, and the nitrogen alone remaining in the cacastic state. Charcoal saturated with azot is also capable of decomposing atmospheric air, by abstracting the oxygious part, which is a remarkable proof how adverse the gaseous state is to chemical combination.

Carbon is capable of combining with sulphur; the sub stance hence resulting is called carburretted sulphur, and although all that is known is yet concerning it is due to the united investigations of Clement and Deformed, two French chemists. It is thus prepared. Fill an earthenware tube with small pieces and powder of newly burnt charcoal, fix it in a flaring direction in a furnace, and lute to the lower end a glass tube, dipping it into some water contained in a receiver. Fasten a glass tube also to the upper extremity of the earthen pipe, and fill it with short cylindrical pieces of sulphur, and fit a cork to the open end of the glass tube with a movable wire passing through its centre, by which the pieces of sulphur may be pushed at pleasure towards the earthen pipe. The apparatus being completely, heat the pipe very gradually, and as soon as the gas casually contained in the charcoal is driven out, cause the sulphur, by means of the wire, to approach the heated part of the apparatus. Allow it to remain at such a distance that it may melt as slowly as possible, and run down among the charcoal; and if these precautions are duly observed, a yellowish oily liquor will soon be perceived in the terminating glass tube, which will drop into the water of the receiver, and collect at the bottom of the tube, without all uniting with the supernatant fluid. The carburretted sulphur thus obtained is a transparent liquid, colourless when pure, but generally of a yellowish-green tinge, and of a disagreeable pungent odour, differing entirely, however, from that of sulphuretted hydrogen. The specific gravity of carburretted sulphur is about 1.3. It evaporates in the air with nearly the same rapidity as ether, and, like this fluid, sinks the thermometer during the process in a remarkable degree. If it is put into an air-pump, and the atmospheric pressure be reduced to about nine inches of mercury, the carburretted sulphur begins to assume the form of a gas; but upon restoring the common pressure, this gas will immediately again resume its liquid state. It takes fire upon the application of a flame, and burns like alcohol, giving out at the same time a sulphurous odour, and depositing both sulphur and carbon. When kept for some time in a vial with atmospheric or azotic gasses, it is diffused by them in small proportion, and renders them inflammable. It combines with nitrous gas, and the mixture burns like zine. When diffused in oxygen gas, the result is a air that explodes with such prodigious violence as to render it dangerous to set fire to even a few cubic measures at the same time. In the state of vapour it combines flowly with the caustic fixed alkalies, forming with them deep amber coloured solutions. By alcohol it is reduced to a soft papery consistence. It diffuses very easily in cold olive oil, or in ether, deposits a little charcoal, and then assumes a crystalline form.

Carbon is said by Proust to be capable of uniting with phosphorus,
CARBON.

phosphorus, but this, from subsequent experiments, appears to be a mistake.

Two of the metals are known to unite with charcoal; when combined with iron the product is called steel; and with copper it forms a peculiar sub stance, first noticed by Dr. Priestley, and named by him charcoal of copper.

The action of the alkalies upon charcoal has been but little examined into; it is certain, however, that caustic potash, by long digestion with this substance, becomes coloured and partly carbonated.

The undecomposable acids appear to have no action on charcoal, but the decomposable ones are deprived of it by their oxygen, either entirely or in part, and the charcoal is changed into carbonic acid; thus phosphoric acid and charcoal yield, by ignition, phosphorus and carbonic acid; sulphuric acid and charcoal yield sulphur, sulphurous acid, and carbonic acid. If highly dried and finely pulverized charcoal is poured into recently prepared oxyhydrogen acid gas; as soon as the two substances come into contact, the charcoal becomes red hot, and falls to the bottom of the vessel, like a shower of fire.

The neutral and earthy faults with decomposable acids are remarkably changed at a red heat by charcoal; the others suffer no perceptible alteration. Thus the sulphates are converted into sulphures, the nitrates become carbonates, while the muriats and duets remain unchanged.

The metallic faults are all of them decomposed by charcoal at a greater or less degree of heat, in consequence of the deoxygenation of their bases, independently of the action of this substance on their acids.

The effects of charcoal in clarification are both curious and important. They were first noticed by M. Lowitz of Petersburg, and have for the most part been amply confirmed by succeeding observers, although the precise cause of these remarkable changes has not been satisfactorily ascertained.

All that is essential for this purpose is, that the charcoal should be in fine powder and very dry; hence the only preparation requisite for its purpose is to pulverize some well burnt common charcoal, and then heat it in a covered crucible to a glowing red, till it ceases to give out an inflammable vapour. If it is not employed immediately, it ought to be kept in a ground flapped glass bottle, and may then be preferred unimpaired for any length of time. The effects of this prepare charcoal are very striking. Being mixed with common vinegar, or any kind of wine, a thick froth rises to the surface, and the liquors, after filtration, are found to be as limpid as water. The filtrate and moisture of the vinegar is in like manner rendered perfectly clear, inodorous and insipid; and rancid oils are also deprived of their smell and taste by repeated filtration through this prepared charcoal. Hence also its peculiar efficacy as a dentifrice; it is sufficiently hard to remove the concretions from the teeth without injuring the enamel, while it neutralizes and entirely destroys for a time any factor which may arise from a carious tooth.

§ 2. Of carbonous oxvd, or gaseous oxvd of carbon.

Dr. Priestley was the first person who efficaciously called the attention of chemists to this substance; but for a correct acquaintance with its nature and properties we are indebted to Mr. Cruickshank. It had always been objected by Dr. Priestley, against Lavoisier's hypothesis of the constitution of fixed air, that when charcoal, however dry, was distilled with scales of iron, or the red oxvd of mercury, the product was not only carbonic acid, but a large quantity of a heavy, inflammable air, resembling, in many respects, carburetted hydrogen, and supposed by Dr. Priestley to be actually this very gas. Now carburetted hydrogen consists of hydrogen, holding carbon in solution; and if it were really produced by the mutual action of carbon and a metallic oxvd, could only be accounted for upon the Lavoisian theory by the calcined presence of some water. But the gas is produced in such great abundance, even when the materials have separately been first exposed to a very high heat to drive off every atom of water, that this hypothesis is untenable; it is, therefore, an obligation of no trivial kind that the modern chemical theory is under to Mr. Cruickshank, for having shewn that this gas, though inflammable, does not necessarily contain any hydrogen whatever, but has only a simple com

The gaseous oxvd of carbon may be produced either by the partial oxygenation of carbon, or the partial deoxygenation of carbonic acid, or the solution of carbon in carbonic acid, on each of which methods we shall proceed to say a few words.

The original experiment by Dr. Priestley is the following. Equal parts of scales of iron and charcoal (each having previously been ignited in separate vessels), were put into a glazed earthen retort and strongly heated. In a short time a prodigious quantity of air came over, which, on examination, was found to consist of one tenth carbonic acid, and the remainder was "an inflammable air of a very remarkable kind, being quite as heavy as common air. The reason of this," Dr. Priestley adds, "was very apparent, when it was decomposed by dephlogisticated air, for the greater part of it was fixed air." The above two important properties, namely, the weight of this gas and its almost total convertibility into carbonic acid by oxygen, are fully confirmed by subsequent experiments.

Mr. Cruickshank, in repeating this experiment of Dr. Priestley, found, that as soon as the retort was red, abundance of gas came over, which, being examined at different periods, was found, in the beginning of the process, to be composed of one part of carbonic acid and four of carbonous oxvd, with a small admixture of carburetted hydrogen; after this, to the end of the process, the proportion of carbonous oxvd gradually increased to about six-nineteenth of the whole. Two ounces of the materials afforded many gallons of the gas.

The sublimed oxvd of zinc was next substituted to the iron scales, and distilled in the same manner with charcoal. Even before the retort became red much gas was given out, and, on increasing the heat, it came over in torrents. It contained a much smaller proportion of carbonic acid than the former, and, towards the end, composed of pure oxvd of carbon. Part of the zinc was found, in the metallic state, sublimed into the neck of the retort. In like manner, thence, the grey oxvd of manganese, and the red oxvd of copper, produced with charcoal, fir, a mixture of carbonic acid with carbonous oxvd, and, at last, the inflammable gas in a state of purity.

The distillation of charcoal and the sublimed oxvd of zinc was repeated by Clement and Deformes, with particular attention to the quantity of products from a given weight of materials. The charcoal and zinc were first heated separately, and examined. Common charcoal, when heated strongly, gave a considerable quantity of inflammable gas, and about 1/1200 of its weight of water. After an hour nothing further came over; so that, to ensure the purity of the
the charcoal, it should be used hot from the crucible or other vessel in which it has been exposed to a full red heat for half an hour. The oxide of zinc gave out nothing at all by being heated \textit{per se}; so that it may at any time be considered as pure, when previously free from accidental moisture.

It was found, by experiment, that 14.96 parts of zinc increased, by calcination, to 17.48 of white sublimed oxide, and hence it is inferred that 100 parts of white oxide consist of 82.15 metal, and 17.85 oxygen. Pure charcoal, prepared as above, was mixed, to the amount of 50 grams, \((4 / 5 \text{ grams})\) with an equal weight of oxide of zinc, which were put into a coated glass retort, communicating with lime-water through which all the gaseous products passed. When first heated, a small portion of carbonic acid gas appeared, rendering the lime-water turbid; but this soon cooled, and the gas was purely inflammable. In five hours the production of gas had entirely terminated, and the total products of the operation were as follows:

<table>
<thead>
<tr>
<th></th>
<th>Grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc sublimed in the retort</td>
<td>21.82</td>
</tr>
<tr>
<td>Charcoal remaining</td>
<td>26.60</td>
</tr>
<tr>
<td>Carbonic acid</td>
<td>0.07</td>
</tr>
<tr>
<td>Nine litres (16.9 wine pints) of inflammable gas</td>
<td>10.35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>58.84</td>
</tr>
<tr>
<td><strong>Loss</strong></td>
<td>1.16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>60.00</td>
</tr>
</tbody>
</table>

In all the preceding experiments the carbonous oxide was obtained by the partial deoxygenation of the metallic oxides and the consequent oxygenation of the carbon. In those which we are about to relate, the same gas was procured by inverting the process, that is, by depriving carbonic acid of a portion of its oxygen.

Dr. Priestley, having obtained an inflammable gas, by heating together carbonates of barites and magnetic oxide of iron, Mr. Craikshank was induced to vary the experiment in the following manner. Equal parts of chalk (heated red hot previously for ten minutes), and of iron filings were mixed together, and heated in an earthen retort, abundance of gas was given out, confining pretty uniformly of one part carbonic acid and five of carbonous oxide.

An ounce of chalk previously heated red for ten minutes, was mixed with an equal weight of zinc filings, and heated gradually in a coated glass retort. A little carbonic acid came over at first, but mixed with oxide of carbon; and when the contents of the retort were thoroughly red, nothing but the inflammable gas came over, and that in prodigious quantity. It was examined at different periods of the distillation, and proved to be wholly un mixed with carbonic acid. After the process, the retort being examined, there was found some sublimed oxide of zinc in its neck, below which was some metallic zinc, and at the bottom was a mixture of oxide of zinc, and partly caustic lime. Chalk, with tin filings, gave a similar result.

In these experiments, the carbonic acid was united to an earthy base before distillation, and consequently was exposed to the deoxygenating effect of the metallic filings in its nascent state, or, at the moment of its assuming the gaseous form, a rate in which airs of all kinds are peculiarly susceptible of chemical change. Mr. Craikshank found, however, that carbonic acid, even in the elastic state, was also susceptible of being deoxygenated by the same means, though not quite so readily. For this purpose, some dry chalk was introduced into an iron retort, over which was rammed some dry sand, and a fragment of tin filings over all. In this arrangement, the carbonic acid gas expelled from the chalk had to traverse a fragment of sand three inches thick, before it could reach the iron-filings. The gaseous products of the distillation were a quantity of undecomposed carbonic acid, together with a large proportion of the inflammable gas, and the iron filings were taken out considerably oxidated. The decomposition of carbonic acid by metals does therefore take place, when the acid is in the gaseous form, but by no means to perfectly as when in its liquid state. A similar decomposition was also effected by forcing the same carbonic acid gas successively backwards and forwards through an iron tube, the residue of which was full of iron-filings, and kept red hot by a small furnace placed beneath it. A bladder was tied to each end of the tube to receive the gas, and, by passing it twenty times slowly through the tube, two thirds of it were converted into inflammable gas.

It is obvious, that if to any base, already united with oxygen, we add a fresh portion of the base, it will have the same relative effect as abstracting part of the oxygen; and thus offers another mode of preparing carbonous oxide, which has been successfully practised by M. E. Clement and Deformes. Pelletier had previously discovered that though the native carbonate of barites is scarcely calcuble, \(\textit{per se}\), in any fire, yet it will readily part with its acid by calcination, if previously ground to fine powder, and mixed with a little charcoal. The chemists above-mentioned, in repeating this experiment with three parts of carbonated barites and one part of charcoal, obtained a large quantity of gas, composed of about \(4 / 5\) carbonous oxide, and \(1 / 5\) carbonic acid, and the barites remaining in the retort was found to be quite calcine. Here, therefore, it is to be supposed, that the carbonic acid is superfused with its own bare, and thus rendered much more volatile than before.

A more direct combination of carbon with carbonic acid was also obtained by the two associated chemists just mentioned, with precisely the same apparatus as that used by Mr. Craikshank for passing carbonic acid gas over red hot iron, except that the tube was filled with pulverized charcoal instead of iron-filings. The first sensible effect produced on the gas was a considerable dilatation, exclusive of the mere expansion by heat, and arising from the solution of a part of the heated charcoal in the gas as it passed over. After each experiment, by far the greater part of the carbonic acid was changed into the inflammable gaseous oxide of carbon, the residual carbonic acid not amounting to more than from \(1 / 5\)th to \(2 / 5\)th of the whole. The remaining charcoal being taken out and weighed was found to be considerably diminished; but the proportional loss was uniformly greater in tubes of iron, than of glass or porcelain, doublets, on account of part of the carbon being combined with the iron, and thus converting it internally into steel. The composition of the gaseous oxide, into which the carbonic acid was changed, calculated from the amount of charcoal taken up by it in porcelain tubes, appears to be about \(53\) of oxygen, and \(47\) of carbon.

The properties of pure carbonous oxide, prepared from chalk or carbonate of barites, and filings of iron or zinc, are the following. It is lighter than atmospheric air, in the proportion of 22 to 23. Hence, its specific gravity (that of water being 1000), will be 1.177, while that of atmospheric air is 1.2305; hence, it materially differs from carburetted hydrogen, the weight of which is not more than half that of common air. It suddenly destroys animal life.
It is in no degree altered by being electrized, per se, for a considerable length of time. It burns in the open air with a quiet, blue flame. When previously mixed with common air and kindled, it does not explode but burns slowly; when mixed with oxygen gas, and fired by the electric spark it explodes, but not very violently, and gives out a red flame. If a small jet, communicating with a reservoir of this gas, be let fire to, and introduced into a large balloon receiver filled with oxygen gas, it is found to burn brightly for a time, and afterwards goes out. The gas remaining in the receiver is not greatly diminished, and the inside of the vessel, though somewhat damp, is by no means fluddled with those visible drops of liquid that characterize the combustion of hydrogen. The residual gas, on examination, will be found to consist of carbonic acid with some uncombined oxygen.

The relative proportions of carbonous oxyd and oxygen requisite to mutual saturation, and the consequent production of carbonic acid, are the means of ascertaining the exact constituent parts of this inflammable gas. When 20 measures of pure gaseous oxyd are mixed with eight measures of oxygen and exploded, the whole is reduced to 18 or 19 measures, and is entirely absorbable by lime-water; it is, therefore, carbonic acid. The weight also of this latter product is found to correspond, as nearly as can be expected in experiments of this kind, with the sum of the weight of its two ingredients before mixture. One hundred cubic inches of carbonous oxyd with 40 inches of oxygen produce 92 cubic inches of carbonic acid, and the weight of the first may be estimated at 30 grains, of the second at 13.6, and of the third at 43.2; the sum of the two first differing from the third only by 0.4 of a grain.

Hence it may be inferred, that 100 parts, by measure, of gaseous oxyd of carbon, require for saturation 40 measures of oxygen gas, and produce, by combustion, about 52 measures of carbonic acid gas; or, by weight, that 100 grains of carbonous oxyd require about 45.5 grains of oxygen, and are converted into 144 grains of carbonic acid, 1.5 grain being allowed for water and casual impurities. Now carbonic acid has been found by Lavoisier and other chemists to consist of 28 parts, by weight of carbon, and 72 of oxygen; consequently 144 grains of carbonic acid (the product of the full oxygenation of 100 grains of the inflammable gas), contain 40.32 grains of carbon; therefore the remainder of the 100 grains of the oxyd, i.e. 59.68 grains, must be oxygen. Hence, carbonous oxyd may be stated as composed of

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Or, by another calculation, 744 grains of carbonic acid contain 72 per cent., or 103.68 grains of oxygen; but only 45.33 grains of oxygen were added to the inflammable gas to produce this carbonic acid, and, consequently, the difference between 103.68 and 45.33, or 58.35 grains of oxygen were already contained in the gas, leaving 41.05 grains, to complete the 100 grains of this gas, for carbon: hence, according to this calculation, carbonous oxyd consists of

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We may, therefore, reckon on an average, that 100 grains of carbonous oxyd, obtained from the decomposition of the earthy carbonates by metallic substances in its purest possible state, unmixed with any hydrogen, are composed of about 41 of carbon and 59 of oxygen.

A true combustion of the gaseous oxyd of carbon takes place when it is mixed with oxyymuriatic acid gas. If the latter be recently made and added to carbonous oxyd in due proportion, the white mixture is converted into carbonic acid and simple muriatic acid; the carbonous oxyd having been fully oxygenated by the excess of oxygen in the oxyymuriatic acid. The proper proportions for the complete success of this experiment are two measures of carbonous oxyd, and 2.5 measures of oxyymuriatic acid. A mixture, thus proportioned, being kept for 24 hours in a ground floppered vessel, and, for further security, inverts in mercury, when opened in water will undergo an instantaneous absorption of about two-thirds, which is muriatic acid gas; the residue, by agitation with lime-water, will be taken up, with the exception of about \(\frac{4}{5}\) th, which is a usual mixture of azot.

Oxyd of carbon, when heated with phosphorus, dissolves a portion, and then burns with a pale yellow flame. The phosphorus is neither oxidized nor acidified by long standing, even when affixed by water.

The effect of hydrogen on the carbonous oxyd is very striking. When equal parts of the gases are mixed together and passed through a glass tube made red hot, a complete decomposition takes place, the gaseous oxyd deposits its charcoal on the inside of the tube, which, being nearly melting, causes it to adhere, and to form a brilliant, uniform, black enamel; while the oxygen of the gaseous oxyd by union with the hydrogen forms water, which is condensed at the further end of the tube. Some of the hydrogen passes through apparently unaltered.

The decomposition of carbonic acid gas, by means of electricity, when in contact with mercury or any other easily oxidizable metallic body, well illustrates the nature of carbonous oxyd. Dr. Priestley was the first who found a change to take place in carbonic acid gas by taking the electric spark in it repeatedly for a considerable time. Out of many experiments, the following may be selected. In a small tube containing about \(\frac{1}{4}\) th of an ounce measure of carbonic acid, and inverting over mercury, the electric spark was taken for the space of an hour; after which the whole tube was clouded by a pulverulent matter of a black colour in the upper part of the tube, but yellow at the bottom, like sulphur. This substance, on examination, proved to be oxyd of mercury. The air itself was a little enlarged, and about a fifth part of it was rendered insoluble in water.

The elegant experiments of Th. de Saussure have thrown much light on this subject. Electric sparks were taken for 18 hours in a glass tube containing 13 cubic inches of dry and pure carbonic acid gas and confined by mercury. After electrization much black oxyd of mercury was discovered; a very slight dilatation amounting to no more than \(\frac{1}{100}\) th of a cubic inch was observed. On throwing up some caustic alkali no more than one cubic inch was absorbed, which was therefore carbonic acid; the next was very pure oxyd of carbon, for whose parts of it were burnt with about a third of oxygen gas no water was perceived, the product being merely carbonic acid.

Carbonic acid has also been decomposed by the same ingenious chemist by hydrogen, by aid of the electric spark. In a long glass tube were mixed together \(\frac{3}{4}\) measures of pure carbonic acid with an equal quantity of hydrogen, and the whole was electrized for twelve hours. A condensation took
towards obtaining an rate. Tor. Of we converted flow finely hot obtained unite totally any very fp f mixture cat I hoi the great !arburetted 111 Carburetted 1 trigonous cryflaili/. condensed form be too large in 11 fatc the of the does aallo possible, lis The the hirnifhed not neither.

In the former fection we have treated of the combination of carbon with a less portion of oxygen than is required for its acidification; in the present fefion we shall examine the phenomena attending the combination of carbon with hydro- gen. Carburetted hydrogen, otherwise called heavy inflammable air, is an inflammable gas considerably heavier than hydrogen, but lighter than carbonous oxyd, or common air: it does not render lime-water turbid, when agitated with it, and by combustion with oxygen is totally refolvable into carburetted and water.

Before it was suspected that carbon could exist in any other flate of oxygenation than carbonic acid, it might be inferred, with tolerable though not absolute certainty, that when any gas had been purified from carbonic acid by means of alkali or lime-water, if it furnished a fresh portion of this acid after combustion with oxygen, the carbonaceous ingredient existed in the flate of pure carbon or charcoal. Therefore, as the only products of carburetted hydrogen, when burnt with oxygen, are carburetted and water, chemists generally fatished themselves with estimating the quantity of carbon contained in the gas, by taking about 28 per cent. of the carbonic acid produced, and fct down the entire remainder as hydrogen. For example, if 100 cubic inches of any gas, weighing 15 grains, were totally refolvable into carburetted and water, by combustion with oxygen; and if, by the combustion, 54 inches of carbonic acid, weighing 25 grains, were produced, the quantity of carbon originally contained in the gas would be reckoned to be seven grains, (being 28 per cent. of the weight of the carbonic acid,) and the difference between 7 and 15, or eight grains would be considered as the weight of the hydrogen; or, in other words, the gas would be called a carburetted hydrogen, confiding of hydrogen holding carbon in folution, in the proportion of eight, by weight, to seven of the latter.

But, it is obvious, that this mode of estimating must be totally erroneous in the cafe (probably very frequent), of a mixture of gafeous oxyd of carbon and hydrogen gas; and hence no approach to analysis can be obtained without acertaining both the water and carbonic acid produced, and even then various caufes of uncertainty will occur.

So that it is poifible, and by no means improbable, that there may exif three fpecies of gaffes, all of which have a claim to the title of hydrocarbonat, or carburetted hydrogen, namely, 1st. hydrogen, simply holding carbon in folution, or what corresponds with the original idea of a hydrocarbonat; 2d. hydrogen mixed with gafeous oxyd of carbon; 3d. a mixture of the two former fpecies, or hydrogen and gafeous oxyd of carbon with an excess of carbon held in folution by one or both of these gaffes.

Carburetted hydrogen is obtained in a great variety of ways, and with very confiderable differences in specific gravity and the proportion of ingrediens. It is found native on the surface of flagrant waters, marshes, wet clays, &c. through which, if examined clofely, large bubbles will be seen to rise in hot weather, and may be derived at pleasure by fhring up the bottom with a fliek. In cold, ftil evenings, if a candle be held over the surface, blafes of a blue lambent flame may be perceived spreading to a confiderable distance. All that is not confiderable in the "rape faurig is probably derived from this fource. This fpecies may be termed, for dilfinition, the carburetted hydrogen of marshes: in the purfet form in which it can be collected it is uniformly mixed with about 20 per cent. of azot.

This gas is also given out very abundantly by almost every vegetable fubflance that is expofed to a dry heat fufficient for its-decomposition. When heated in close velfets much more hydrocarbonat is obtained than by combustion in the open air, the product in this latter cafe containing more carbonic acid. It would be endles to enumerate the vegetable sources of this gas, but we shall mention some of the most convenient modes of obtaining it in a flate of purity.

One of the commonest methods employed is the destractive diffusion of the aceto salts. For this purpose, let a foal proportion of dry acetit of potafli be heated in a glafs retort. The falt foon melts in its water of cryfhalization, pufps up, and, if the retort is too small, is very apt to come over into the neck. The firft products are water and the air of the velfets; but, when the aceto acid begins to be fcorched, a large fream of gas begins, and continues till the whole is red hot, and little effe remains in the retort but carburetted alkali and a little charcoal. Along with the gas there arises much oil, which is condensed in the cool receiver. The gas, according to the analysis of it by Dr. Higgins, after the firft portions have puffed over, consists of nothing but hydrocarbonat and carbonic acid, which laft may be feparated by lime-water. The hydrocarbonat itself varies confiderably. The firft part is much heavier than the laft, (though ftil lighter than common air,) and appears to hold in folution part of the oil; for, on flanding fome time over water, it becomes lighter, and is found to require lefs oxygen for faturafion than before. The average specific gravity of the firft and laft gas mixed is to that of common air as two to three.

Carburetted hydrogen is obtained in great purity by fending the vapour of inflammable vegetable matter through an earthen or glafs tube paffing through a furnace, and kept red hot in the middle. The vapour of camphor, ether, alcohol, and other inflammables thus treated, is converted into this gas, but with much difference in quantity, according to the degree of heat and other circumstances.

Another method of obtaining carburetted hydrogen, is to put coal, wood, peat, &c. into any convenient vefsel, a earthen or iron retort for example, and heat it slowly to reduce.

Most animal inflammable fubfiances, fuch as filk, fat, wax, and the like, yield this gas as freely as vegetable matter, by a similar treatment. This was discovered by Berthollet, in his matterly rearches on the nature of animal matter and ammonia.

Carburetted hydrogen (or at leaft a gas that gives water and carbonic acid by combustion with oxygen), is also generated in abundance, when charcoal, without previous drying, is heated per 2 in clofe velfets, and continued to be given off till the charcoal has been in a flate of full ignition about an hour; after which it ceafes, and the charcoal, as already mentioned, is rendered pure. A similar process of obtaining...
this gas, is to inclose powdered charcoal in a tube passing through a furnace, to confine the charcoal by a pellet of clay loosely fixed at each extremity of the tube, and in that situation to send through it the vapour of water kept boiling in a small retort attached to one end of the tube. Much carbonic acid gas is generated this way, and, when this is separated by lime-water, the residue is inflammable.

Lastly, this gas may be procured by the direct union of its constituent parts. If hydrogen gas is passed seven or eight times successively through an iron tube containing charcoal, and heated red hot, a diminution of bulk takes place, the hydrogen dissolves a portion of the charcoal, and then assumes the properties of carbonised hydrogen.

A curious variety of hydrocarbons, was discovered by the associated Dutch chemists (Van Dieman, Troostwyck, and others) which is procured from ether or alcohol, and has the remarkable property of generating an oil when mixed with oxyumariatic acid gas. Hence it has been termed oily carburetted hydrogen, or olefiant gas. The mode of preparing this singular gas, and the enumeration of its distinguishing properties, will form the subject of the next section; it may, however, be observed here, that according to Mr. W. Henry’s experiments, the olefiant gas appears also to be contained in part in the hydrocarbonat from coal, wax, and some other substances, and greatly to contribute to the quantity of light and heat which these gases give out as well as to their large proportion of carbonic acid.

Carburetted hydrogen is singularly affected by the electric spark. Dr. Auflin found, that on taking the electric spark repeatedly through this gas, obtained from acetate of potash, the bulk of the gas enlarged after every shock, and at length expanded to nearly twice its original dimensions. When examined after this expansion, it was found to be as inflammable as before, and judging from the test of lime-water no carbonic acid appeared to have been generated. Dr. A. concludes that the enlargement can only be owing to the production of a quantity of hydrogen, and makes some inferences which, however, have since been shewn by Mr. W. Henry to be erroneous. Mr. H. demonstrates that there is no destruction of carbon by this process, since the same quantity of carbonic acid is produced after as before electrization by the action of oxygen gas. He likewise makes it appear probable, that the water held in solution by the gas is the chief agent in its expansion, since when the gas has been dried by caustic alkali no continuance of electrization will enlarge it more than one sixtieth of its original bulk; but when the contact of water is admitted, the bulk is doubled by the same treatment. Perhaps the discovery of carbonous oxyd will explain this fact. It is not improbable that the carbon of the gas may unite with the oxygen of the water, and thus produce the carbonous oxyd which would not give any precipitate with lime-water, and the bulk of the gas would be enlarged both by the carbonous oxyd and the hydrogen of the water, as well as by the expansion which the hydrocarbonat would undergo after the carbon was separated from it, whilst the actual quantity of carbon remaining the same, as much carbonic acid would be separated by complete oxygenation as before electrization. It is not improbable that the affinities of hydrogen and carbon for oxygen are so nearly equal, that either substance is able partially to decompose the complete oxyd of the other. Thus we find, that when hydrogen and carbonic acid are together subjected to electricity, the carbonic acid is partially decomposed, and the product is carbonous oxyd and water, and on the other hand, when water is decomposed by red hot charcoal, a part of the product is also the carbonous oxyd.

All the hydrocarbonats are fatal to animal life; not at appears from the mere absence of oxygen, but from the pre-}


definition of something positively noxious; since animals immersed in it die sooner than they would from the mere inter-}


teption of respiration.

This gas is scarcely if at all absorbed by water, but by long standing over it deposits a part of its carbon. This, however, applies only to those hydrocarbonats that require at least their own bulk of oxygen to saturate them, and especially to that variety called olefiant gas.

Simple carburetted hydrogen, when set fire to, burns at the surface in contact with the air with a blue flame with red edges, but when mixed with any of the olefiant gas the flame becomes much more brilliant, resembling that of carbon. When applied to the purposes of illumination the hydrocarbonat from coal, from lamp-oil, or from wax, produces as much light in an Argand lamp as oil in substance does; this appears to be owing to the olefiant gas which they contain. The brightness of the flame is much diminished when these gases have been kept over water, and hence for illumination they should be used as soon as prepared.

The combustion of hydrocarbonat is much more brilliant in oxygen gas, and the products if a sufficient quantity of oxygen has been used, are merely water and carbonic acid.

If any of the hydrocarbonats be mixed with oxygen gas and fired in a close vessel by the electric spark, or in any other way, an explosion takes place more or less violent according to the quantity of carbon contained in the gas, and the result of the decomposition is carbonic acid, together with any unconfused gas or excess of oxygen, while the water is found condensed in drops on the sides of the jar. A single cubic inch of the mixed airs is generally as much as can be conveniently managed at each explosion, and when any olefiant gas is present even this small quantity will endanger very thick glass jars; a very vivid red flame appears at the moment of explosion, and a great inflammable enlargement takes place, after which the bulk is suddenly reduced to much less than its original quantity. When the carbonic acid is absorbed, if the gases have been properly proportioned, no gaseous residue is left except accidental impurities.

The oxyumariatic acid furnishes also a very useful method of decomposing and analysing all the hydrocarbonats. Mr. Crickshank’s beautiful and accurate experiments on this subject are highly instructive. The oxyumariatic acid gas was procured from oxyumariat of potash, by means of muriatic acid, and was used soon after being prepared, as it is in some degree altered by keeping.

Pure hydrogen and oxyumariatic acid gas were first tried; one measure of the former with two of the latter mixed in a glas vial with a ground flopper, and inverted over water were suffered to remain 24 hours. The flopper being then withdrawn, the water rushed into the vial, absorbing the whole of its gaseous contents, except about 1/3 of the whole, which was azot, and doublets a casual impurity.

The different hydrocarbonats were then tried. In a bottle filled with, and inverted over water, one measure of well washed hydrocarbonat from camphor was mixed with two of oxyumariatic acid. A slight cloud and trifling absorption were perceived at the time of mixture, after which the flopper was put in, and the whole was left at rest for 24 hours. When opened under water all the gas was absorbed, except 0.45 of a measure, and this was reduced by lime-water to 0.34. This residue was still inflammable, but burnt with a lambent blue flame like carbonous oxyd; and this
this it was proved for the most part to consist of, by the large quantity of carbonic acid which it yielded when fired with oxygen; two parts of it with one of oxygen yielding no less than 1.7 of carbonic acid.

In the above experiment the mutual decomposition of the oxymuriatic acid and carburreted hydrogen produces no less than four new compounds: namely, common muriatic acid by the loss of oxygen; water by the union of oxygen with hydrogen; carbonous oxide by the partial oxygenation of one of the carbon; and carbonic acid by the copious oxygenation of the remainder.

On increasing the quantity of oxymuriatic acid to about four times that of the carburreted hydrogen, the whole of the carbon was found to be completely oxygenated, and every thing was absorbed by water or lime-water; the products were therefore only muriatic and carbonic acids and water.

Mr. Cruickshank found a very considerable difference in the quantity of carbonic acid produced, and of course in the carbonaceous ingredient in the hydrocarbonats from camphor, ether, and alcohol, when they had been long kept over water or agitated with it. A similar difference in the quantity of combustible matter was observed by Dr. Higgins, in the hydrocarbonat from acetate of potash, which renders it highly probable that these hydrocarbonats hold in solution somewhat of an oily ethereal vapour, or a portion of true olefiant gas which water will absorb. This also, it probably is, which causes the slight diminution which some of the hydrocarbonats immediately experience when mixed with oxymuriatic acid gas; for with pure olefiant gas the diminution is great and immediate, as we shall presently mention. When oxymuriatic acid gas and carburreted hydrogen are mixed in the proportion of two of the former to one of the latter, and the mixture is exploded by the electric spark, a copious deposition of charcoal takes place, but when oxymuriatic acid gas is used in a larger quantity, the whole of the carbon is converted into carbonic acid. This separation of charcoal takes place only with the hydrocarbonats from camphor, ether, and alcohol, and even in these this property is lost by being kept some time over water.

Carburreted hydrogen is also readily decomposed by sulphur; the carbon being precipitated in a form of a black powder, and the hydrogen uniting by preference with the sulphur forming hepatic gas. This may be most conveniently effected by making sulphur red hot in an earthen tube and then passing the carburreted hydrogen through it.

§ 4. Of olefiant gas.

The discovery of this singular species of carburreted hydrogen is due to some associated chemists of Amsterdam, (Van Dieman, Van Troostwyck, Bordet, and Lawrenburgh,) and originated in their examination of the different products of the distillation of sulphuric acid and alcohol, in the preparation of ether. In the common process this gas appears towards the latter end of the distillation accompanied by the oil of wine; but in order to procure it immediately, for the purpose of experiment, nothing more is necessary than to put into a proof bottle a little rectified alcohol, and four times its weight of strong sulphuric acid; much heat is given out on mixture; the colour becomes first brown, and then black, and on the application of a gentle heat the gas in question is produced in vast abundance, and may be collected in jars inverted over water. The only foreign matters with which the gas is mixed are sulphuric acid, and a little ether, but these may be got rid of by washing it with some very dilute liquid ammonia, and then the olefiant gas remains pure.

When thus prepared it exhibits the following properties. Its specific gravity is to that of atmospheric air, as 935 to 1000. Its odour is very pungent. It burns with a dense flame, like an oil or resin. It is not adsorbed nor altered by water, nor is it affected by any of the common reagents, whether gases, alkalies, or acids, except the oxymuriatic acid gas. Equal parts of these gases being mixed together, an immediate diminution of bulk takes place, a visible vapour fills the vessel, much heat is given out by, to be very sensible even to the hand, and at the same time a thick pearl-coloured oil appears in drops on the surface of the water, over which the mixture is made, and immediately links to the bottom.

It is from this singular production of dense oil, with the oxymuriatic acid, that this species of carburreted hydrogen has acquired the name of olefiant or oil making. When these two gases are mixed in the proportion of four of oxymuriatic acid to three of carburreted hydrogen, the whole is absorbed, except accidental impurities.

The oil thus generated is heavier than water, whitish, and semi-transparent. By keeping it becomes yellow and limpid; its odour is highly fragrant and penetrating; its taste is somewhat sweet. It is sparingly soluble in water, to which it communicates its peculiar odour. Cauolic potash has no effect on the oil, but separates the adhering muriatic acid and renders it more fragrant.

The constituent parts of olefiant gas appear to be only carbon and hydrogen, but it contains a larger proportion of the former than the common hydrocarbonats do. It is decomposed by Sulphur like the other hydrocarbonats.

The combustion of this gas offers some curious circumstances. When an Argand lamp is supplied with it instead of oil, the flame far exceeds every oil and hydrocarbonat in beauty and brilliancy. When mixed with oxygen gas, and detonated by the electric spark, the explosion is much more violent than that of common carburreted hydrogen. Mr. Henry found that a strong glass tube was shattered with only 0.3 of a cubic inch of olefiant gas, and 0.17 of oxygen; but when the quantity of oxygen is considerably below that required, for the complete saturation of this gas, only a very trifling explosion is produced.

Another singular property of olefiant gas is the copious deposition of charcoal, when it is mixed with a small quantity of oxygen or oxymuriatic acid gas and kindled. After the mixture of the olefiant and oxymuriatic acid gasses, two or three minutes elapse before the oil thus generated is entirely precipitated, but if this mixture is immediately set fire to there is no production of oil; but in its stead a copious deposition of charcoal takes place, that the whole vessel is obscured, as if it had been lined with lamp-black.

A similar depoition of carbon takes place when the olefiant gas is mixed with just enough of oxygen to begin the combustion. If two parts of the latter are mixed with 1 of the former, and the mixture set fire to by the electric spark, a copious deposition of carbon ensues.

The great excess of carbon contained in olefiant gas is also manifested from the large proportion of carbon required for its saturation, amounting to 2.84 to 1, estimating each by bulk.

Olefiant gas has also been procured by the Dutch chemists, above named, not only from alcohol and sulphuric acid, but by passing the vapour of alcohol or ether through a red hot earthen tube. In this case, however, the olefiant gas appears to be mixed with a little carburreted hydrogen. It is remarkable, that if a glass tube be used instead of an earthen one, the gas is no longer olefiant, but only simple carburreted hydrogen; but if the glass tube is filled with either
CARBON.

either alumine or silice the same effect is produced as with the earthen tube; on the other hand, when lime either pure or carbonated, or magnesia, were substituted to the two other earths, the gas was common'd carburetted hydrogen.

The whole of this very interesting part of chemistry requires further examination, especially as far as regards the formation of carbonous oxide.

CARBON, in reference to Hylomancy and Gardening, a matter obtained from different animal and vegetable substances, by means of a flow and confined combustion. This substance is charcoal in its pure state; that which is commonly met with containing a portion of incombinable earth, and some saline matter in union with the charcoal. See Carbon and Coal.

The author of the "Philosophy of Agriculture and Gardening," remarks, "that when animal and vegetable bodies are burnt without the access of air, that is, where their volatile parts are sublimed, there remains a greater quantity of charcoal, a much greater in vegetable bodies than in animal ones. This is termed carbon by the French school, when it is quite pure, and is now known to be one of the most universal materials of nature: and as vegetable bodies contain so much of it in their own composition, they may be supposed to absorb it entire where they grow vigorously, especially as it is a simple material: but they may profitably form it also from water and air within their own vessels, when they are excluded from access to it externally. The whole atmosphere contains always a quantity of it in the form of carbonic acid, or fixed air; as is known by the scum which presently becomes visible on lime water when exposed to the air, and which consists of a reunion of the lime with the carbonic acid, which may therefore be said to encompass the earth. The simplicity of carbon as an elementary substance was disputed by Dr. Auffli, who believed he had compounded it. But Mr. Henry, by accurately repeating his experiments, has shown the fallacy or inconclusive nes of them, as may be seen in the Philosophical Transactions for 1797. And it is added that a further great refervor of carbon exists in lime-flone, in the form of carbonic acid, which when the stroniger acid is poured on, the calcareous earth becomes a gas, acquiring its necessary addition of heat from that which is given out in the combination of the stroniger acid with the lime. It also acquires its necessary heat when lime-flone is burnt, from the confuming fuel, rising in the form of gas, and is diffused in the air; and probably soon settles on the earth as it cools, as it is considerably heavier than the common atmosphere. But the great source of carbon exists in the black earth which has been lately left by the decomposition of vegetable and animal bodies; and is then in a flake fit to combine with azote or nitrogen, and with oxygen, when exposed to those two gasses, as they exist in the atmosphere, and is thus adapted either to promote the generation of nitrous acid, or to form carbonic acid, and thus to afflit vegetation. Morals consist principally of the carbonic recumments of vegetable matters, which are gradually decomposed in great length of time into clay, with argilaceous sand, such as is found over coal beds, and some calcareous earth, as in marl, and lastly, with some iron and fusile coal. Thee by elution are separated from each other, and form the flata of coal countries.

In other places they remain intermixed, as they were probably produced from the decomposition of vegetables and terretrial animals; and form what in books of practical agriculture is called a loamy soil, consisting of carbonic matter, sand, and clay, with a portion of iron. It has always been observed, that this black garden mould, or earth produced from the recumments of vegetables, is capable of absorbing a much greater quantity of putrid effluvia than either air or water, and probably of combining with its ammonia, and producing a kind of tepar carbonis, and thus facilitating vegetation. The practice of burying dead bodies so few feet below the surface is a proof of this; as the putrid exhalations from the carcass are retained, and do not penetrate to the surface. On the same account, the air over new ploughed fields has long been esteemed salutary to invalids, or convalescents, as it probably purifies the supernatant atmosphere. But it was not till lately known that carbon, or charcoal, absorbs with such avidity all putrid exhalations; if it has been recently burnt, and has not been already satureted with them: inomuch that putrid flesh is said to be much sweetened by being covered a few inches with the powder of charcoal, or even for being buried for a time in black garden mould; as putrid exhalations consist chiefly of ammonia, hydrogen, and carbonic acid, and are the immediate products of the disulution of animal or vegetable bodies; they are believed to contribute much to vegetation, as whatever materials have confluted an organic body may again, after a certain degree of disulution, form a part of another organic body. The hydrogen and azote produce ammonia, which combining with carbon, may form an tepar carbonis, and by thus rendering carbon soluble in water, may much contribute to the growth of vegetables. It has been said, that some morals have prevented the animal bodies which have been buried in them from putrefaction; which may in part have been owing to the great attraction of the carbon of the morals to putrid effluvia, and in part, perhaps, to the vitriolic acid which some morals are said to contain in their constitution."

"Then here occurs," says the author, "an important question. By what other means is the solid carbon rendered fluid, so as to be capable of entering the fine mouths of vegetable absorvents? The carbon, which exists in the atmosphere, and in lime-flone, is united with oxygen, and thence becomes soluble or diffusible in water; and may thus be forsoed by the living action of vegetable vessels; or may be again combined by chemical attraction with the lime, which has been depraved of it by calculation. When mild calcareous earth, as lime-flone, chalk, and marble, has been depraved of its water, and of its carbonic acid by calculation, it becomes lime. Afterwards, when it is cold, if water be sprinkled over it, a considerable degree of heat is faintly perceived, which is preffed out by the combination of a part of the water with the lime; as all bodies when they change from a fluid state to a solid one, give out the heat which before kept them fluid. At the same time, another part of the water which was added, is raised into steam by the heat given out, as above mentioned, and the expansion of this steam breaks this lime into fine powder, which otherwise retains the form of the lumps of lime-flone before calculation. But if too great a quantity of cold water be suddenly added, no steam is raised, and the lump of lime-flone retains its form, whence it happens, that some kinds of lime fall into fluid powder, and are said to make better mortar, if flaked with boiling water, than with cold. On this account, the lime which is designed to be spread on land should previously be either laid in a heap, and either suffered to become moist by the water of the atmosphere, or flaked by a proper quantity of water; otherwise, if it be spread on wet ground, or when so spread is exposed to much rain, the heat generated will be diffusled without breaking the lumps of lime into powder, which will then gradually harden again into lime-flone, disappont the expectations of the agriculturist, and afflict him with the los of much labour and expence. When the powder of flaked lime, mixed with sand and water, is spread on a wall, that part of the water which is not necessary
necessary for its imperfect crystallization, evaporates into the air, and the lime then gradually attracts the carbamic acid, which is diffused in the atmosphere, but as he supposes this carbamic acid is dissolved in the water, which is also diffused in the atmosphere, the lime is periodically moistened by this new acquisition of water from the air, as that which before adhered to it, and had parted with its carbamic acid, evaporates. On which account, new built walls are moistened, and even years in drying, as they continue to attract water along with the carbamic acid from the air, which is always mixed with them in drops till the lime regains its original quantity of carbamic acid, and again hardens into flint, or forms a spar by its more perfect, or less disturbed manner of crystallization. It is consequently supposed, that the earth acquires carbon, both in a manner similar to the above, by its attracting either the carbamic acid, or the water in which it is diffused, from the atmosphere, and also by the specific gravity of carbamic acid gas being ten times greater than that of common air: whence, there must be constantly a great sediment of it on the surface of the earth, which in its state of solution in oxygen and water may be readily drank up by the roots of vegetables. Another means by which vegetables acquire carbon in great quantity, may be from lime-flint diffused in water, which though a flower proceeds, occurs in innumerable springs of water, which pass through the calcareous or marly strata of the earth; as those of Matlock or Bristol in passing through lime-flint, and those about Derby in passing through marl; and it is brought to the roots of vegetables by the flowers which fall on foils where marl, chalk, lime-flint, marble, alabaster, and flour, exit, which include almost the whole of this island.

By this dissolution of mild calcareous earth in water, not only the carbon in the form of carbamic acid, not yet made into gas, but the lime also which with it is united, becomes absorbed into the vegetable system, and thus contributes to the nutriment of plants, both as so much carbonaceous earth, and as so much carbon.

And another mode may be by the union of this simple substance, with which all garden mould abounds, with pure calcareous earth into a kind of bepar, analogous to the heap of sulphur made with lime, which abounds in some mineral waters, and this is supposed to be the great use of lime in agriculture.

For the purpose of ascertaining the probability of this mode of soluition of carbon, the following experiment was made. "About two ounces of lime in powder was mixed with about as much charcoal in powder, put into a crucible, and covered with about an inch or two of silicious sand. The crucible was kept red hot for an hour, or longer, and then suffered to cool. On the next day water was poured on the lime and charcoal, which then yielded a day or two in an open cup, and acquired a calcareous féum on its surface. And though it had not much salt, except that of the causticity of the lime, yet on dropping one drop of marine acid into a tea spoonful of the clear solution, a strong smell like that of bepar sulphuris was procured, or like that of Harrowgate water, which evinced that the carbon was thus rendered soluble in water. Hence, the doctor suggests, that the sulphureous smell of Harrowgate and Kidderwallon waters, and other similar springs, may be owing to the union of the alkali of decomposing marine salt, with the carbon of the earth they run through, and that this kind of water might thus possibly be used as a profitable manure in agriculture." And a still further method by which vegetable roots acquire it, is inspected to be "by their dismuting carbamic acid from lime-flint in its fluid, not its gaseous state, which the lime-flint again attracts from the atmosphere, and conso-
A gradual heat. A double decomposition takes place; the carbonic acid of the chalk uniting with the ammonia, and rising to the top of the vessel, and the lime remaining behind in union with muriatic acid. By degrees the carbonat of ammonia, which rises as a dense white vapour, condenses on the top of the vessel in a hard semi-transparent cake. The mixture of time that remains, was formerly applied to little use, but since the discovery of its wonderful powers, as a freezing mixture when combined with snow, it may perhaps be made more valuable. The whole of the carbonat of ammonia is not obtained till after the vessel has been kept for some time at a low red heat.

The above is the actual way of preparing this salt, but the combination of the two ingredients may be made for experiments which gives a very beautiful appearance. Fill a jar about half full of carbonic acid gas standing over mercury, then throw up ammonical gas (obtained in the way mentioned under ammonia), and at the moment of contact, a very dense white cloud of carbonat of ammonia will fill the jar, a sudden and complete abstraction will take place, and if the gases be pure and properly proportioned, the mercury will rapidly rise, and fill the whole cavity, leaving only a pellicle of white false matter attached to the side of the glass, which is the solid ammonical carbonat. Some heat is also given out during this condensation of the gases enough to be sufficient to the hand placed on the outside of the jar. To make the mixture of the gases, sudden, the ammoniac should be added to the carbonic acid gas; for the former, being by much the lighter, then traverses the whole of the latter, and rises with it; but if this order is inverted and the carbonic acid added last, a white cloud is seen hovering over, and defining the point of contact of the two, and the abstraction is more gradual. The same condensation may be shown over water, (though not with the accuracy of measuring the respective quantities of the gases) simply by inclining any vessel full of a mixture of lime and mixture of ammonia in an atmosphere of carbonic acid gas, the ammoniacal gas given off by this mixture feizing on the carbonic acid the instant it touches it.

The common solid carbonat of ammonia, when fresh made, or kept in a very close-closed bottle, is a hard, tough, white, white-feltrite, or malleable, of no determinate form. Its smell is extremely pungent, and to most persons agreeable, but when strongly inflamed it is apt to excite the nostrils. Its taste is flat, cool, and stimulating. It is very soluble in water, producing cold during the solution. At 53° water diffuses half its weight, and at 120° degrees its own weight; but at this heat the alkali begins to volatilize, and being dry, and the air blown through it, the air blown through it, so that the volatile contents of the solution are always varying. The salt, whether wet or dry, is remarkable for its volatility, the more in proportion to the heat, but even at a low temperature it is always losing weight whilst it retains its form.

The crystallization of carbonat of ammonia is very difficult on account of its volatile nature, so that the common way of making a hot saturated solution and crystallizing by cooling will seldom answer. Bergman obtained tolerably regular crystals by taking a fataturated solution at a moderate temperature, fataturing this with carbonic acid, and then exposing it to severe cold, the crystals appeared to be octahedrons with truncated angles.

Carbonat of ammonia, on account of its rapid solubility, and the quantity of carbonic acid it contains, effervesces more violently with acids than most of the other carbonates.

A remarkable change takes place in this salt if exposed to the air. Let any quantity of the hardest and the most pungent carbonat of ammonia be bruised to powder, spread on a plate, and exposed to the air, and in a very short time the surface becomes crumbling, and of an opaque white, and the whole atmosphere around will be strongly feented with a pungent ammoniacal vapour arising from the rapid volatilization of the salt. This loss of weight is so great, that in the course of ten or twelve hours no more than from forty to fifty per cent of the original weight will remain, and the salt is then changed to a soft pulvèrulent meal-like substance almost without scent or pungency to the taste. This same change takes place sooner or later to the fresh salt, if kept in bottles carelessly stopped.

Hence it appears probable that the recent or pungent carbonat contains a quantity of ammonia in excess, to which it owes its pungency and volatility, and that the effloresced salt probably consists of carbonic acid and ammonia in mutual saturation, together with a quantity of water.

This salt is soluble in alcohol, and thus an ammonical spirit is made by distilling the two together, often with various aromatic additions. See ammonia.

**Carbonat of Petapa.**—Common petapa.—Pearl-ash.—Salt of Tartar.—**Vegetable fixed Alkali.** The vegetable fixed alkali was so named by the chemists of the last and former ages because it was procured in large quantities from vegetable substances, and was in no case supposed to be of a mineral origin. From certain late analyses, however, by Klaproth and other able chemists, it has been discovered to enter as an essential ingredient into the composition of leucite, lepidolite, and a few other minerals, which are suspected by many to be of vegetable origin. But though the existence of petapa in a mineral state has been thus demonstrated, yet it is so small in quantity and so difficultly procurable, that all the vast supplies of this substance which civilized life requires have as yet been entirely obtained from the combustion of vegetables.

If the woody or annual items of vegetables that have grown in soils unimpregnated with common salt, after being insufficiently dried, are kept in the presence of the wetness, the refined, the oily, the acid, and carbonaceous portions are volatilized and dissipated in a state of more or less complete decomposition, and there remains behind a reddish or whitish powder called petapa; confining chiefly of the earthy and metallic ingredients of the vegetable, together with a variable proportion of subcarbonat of petapa. By abstraction of the alkaline part is dissolved out, and this solution, when boiled down to dryness and melted, leaves behind a dark brown fætus of a fætous nature, on which the greenish vegetable substance of the carbonat petapa, coloured by a small portion of vegetable inflammable matter; and in this state it is known in the English market by the name of petapa. Calcination at a moderate red heat completely burns off the colouring particles, and the salt becomes of a pungent texture, and has a beautiful bluish white tinge, and is more called petapa.

Such as is in general the procs by which the vegetable fixed alkali is separated from the substances with which it is combined by nature, and prepared for use. We shall now proceed to describe more at large the different methods of extracting this salt.

The simplest and rudest preparation of petapa is called aeb-balls in England, and went-eb in Ireland. It cannot be said properly speaking to be an article of commerce, although a considerate quantity is annually made by the peasantries of both countries, and disposed of among the neighbouring farmers and bleachers. The vegetable from which in England and Scotland this impure alkali is produced, is the common fern or brackens (*Pteris aquilina, Linn.*) Many rough and heathy districts are entirely covered by this plant, which, when it has attained its full growth, about the
of July, is cut down, and after being half-dried in the open air is gathered into small heaps and kindled. The combustion proceeds slowly, being accompanied by a mothering smoke and little or no flame, till the whole is reduced to a reddish-grey ash: this being carefully collected is sprinkled with a little water, and then moulded by hand into balls three or four inches in diameter, which, when they have acquired a certain luster by drying in the sun, are ready for sale. In Ireland, thistles, docks, and weeds of all kinds are mixed with the fern, and the ashes are dipped in of their loose palidulent flake without any further preparation. According to Dr. Home, fern ashes contain about 3/4 of their weight of salt, consisting principally of sulphate and carbonate of potash: 1000 parts of the plant cut in Angull and thoroughly dried afford 36.46 of ashes, from which are obtained by lixiviation 4.5 of salt. The common leafy weeds ashes have been analysed by Mr. Kirwan, and when deprived of their water by a red heat, appear to contain one part of salt for 3.5 of ash; of this the free alkaline portion, however, amounted only to 1/5 of the whole.

The potash of commerce, or black potash, as it is also called, is universally procured from the combustion of wood; and therefore its preparation can only be undertaken with success in those uncultivated countries where are vast natural forests, and where, from the badeens of the roads, and imperfecting of water communication, the value of timber is no more than that of the labour required to fell it. The only districts of Europe in which any considerable quantity of potash is made, are the mountainous forests of Germany, and the extensive woodlands of Poland and Russia. The British market, however, is principally supplied from the United States of North America, a country in which, from its rapid increase of population, there is a present demand for cleared land for the purposes of agriculture, and therefore, where timber is looked upon rather as an incumbrance than as contributing either to the beauty or value of the ground on which it stands.

The American method is to pile up the wood, as soon as it is sufficiently dry to burn, in large heaps, and reduce it as quickly as possible to ashes: these ashes are then put into a wooden cistern with a plug at the bottom of one of the sides, and a quantity of water sufficient to make a strong lixivium is added; after standing for an hour or two the plug is withdrawn, and the water holding the potash in solution runs out, leaving the earthy part still impregnated with salt in the cistern.

This solution is then evaporated to dryness in iron pans and finally fused into compact reddish brown masses of semi-cauliform potash, in which it will be seen that it is fit for the market.

In Germany, where the value of wood is greater, and where more intelligence and economy are practised in the preparation of potash, the general method of proceeding is the same as that just mentioned, but with great variations, as in the smalling of little consequence, materially augment the produce of alkali. Care is taken to fell such kirds of wood as are the richest in potash, the combustion is slower, and of course the temperature lower, in consequence of which, but little is lost by volatilization; the lixiviations also of the ashes are judiciously repeated till the whole of the alkali is extracted.

The common Russian potash is the impurest of all, containing nearly one half its weight of earth; and is thus prepared. A large pit is dug, into which are thrown burning brands and the smaller extremities of the branches, and when the whole is well kindled, the pit is filled up with logs and other large pieces, which at length, though very slowly, are reduced to ashes. The outer part of the ashes is then separated, by digging, from the floor; all the earth that is contained is procured by box-stones, and this laponite is mixed with the remainder of the ashes and worked into large palls. A piece of thin mould of wood, the interstices of which are filled with this pulp, which being set hard, the mass is reduced to a mass. This process is repeated several times till the ashes begin to set and become black; the most compact pieces, being then selected, are packed up for sale without any further preparation: the ashes lixiviated and boiled down to dryness in the usual manner.

Potash is converted into a much purer substance, called pearl ash, by calculation: for this purpose the potash broken into moderate small pieces is spread on the floor of a reverberatory furnace, and being kept red hot, but not melted, for an hour or two, having, at odd times, an iron raker, all the carbonaceous and coloured particles are burnt out, and there remains behind a dry, porous, red, considerably caudiform salt, extremely deliquescent, and from its bluish white colour, called pearl ash.

It has been thought of consequence, in an economical point of view, to discover the proportion of potash afforded by different vegetables, and many analyses have been made for this purpose. They are, however, for the most part unsatisfactory, as they indicate only the proportion of soluble saline ingredients without distinguishing the carbonated potash from the sulphate and murirof potash with which it is always mixed. The most remarkable and interesting results will be found in the following table, part of which was ascertained by a committee of the academy of sciences at Paris and the rest by the chemists whose names are subjoined: 100 parts of each different species being previously thoroughly dried were burned by an open fire to ashes, which after being weighed, were accurately lixiviated till all their saline contents were extracted.

<table>
<thead>
<tr>
<th>100 Parts</th>
<th>Salt from</th>
<th>Authority</th>
</tr>
</thead>
</table>
| Fumitory  | 21.9      | 7.9       | Wiegde |}
| Wormwood  | 9.74      | 7.3       | 74.8   | ditto |
| Common nettle | 10.67 | 2.5       | 23.4   | Pertuis |
| Sow thistle (Sonchus arvensis) | 10.5 | 1.66 | 18.6 | ditto |
| Fern      | 5.02      | 12.5      | ditto |
| Ditto     | 3.64      | 11.6      | Home |
| Stalks of maize | 8.86 | 1.75 | 19.7 | Acad. Sci. |
| —— funflower | 5.72 | 2.1 | 34.9 | ditto |
| Buckwheat | 33.3      | Vaupelina |
| Vine branches | 3.4 | 0.55 | 16.2 | Acad. Sci. |
| Heath     | 11.5      | Wildenheim |
| Foxglove (Digitalis purpurea) | - | - | 32. Soc. |
| Celandine (Chelidonium majus) | - | | 25. | ditto |
| Nightshade (Atropa belladonna) | - | - | 25.7 | ditto |
| Boxwood   | 2.0       | 0.22      | 7.8    |
| Sallow    | 2.3       | 0.28      | 16.2   |
| Elm       | 2.3       | 0.39      | 16.6   |
| Oak       | 1.3       | 0.15      | 11.1   |
| Beech     | 0.58      | 0.12      | 21.9   |
| Alpen     | 1.22      | 0.07      | 6.1    |
| Fir       | 0.34      | 0.04      | 15.2   |

Upon a cursory inspection of this table it appears that the succulent herbaceous plants afford a prodigiously greater proportion...
proportion both of ashes and salt than the flinty and lignaceous ones: it is, however, to be observed, that they were all reduced to a state of perfect dryness before being weighed, a circumstance which will in a considerable degree account for the apparently greater quantity of salt contained in the succulent vegetables; for while the different kinds of wood will not lose more than 2/3 or even 1/2 of their weight in drying, flinty or even more: it is not likely, therefore, that it can ever be worth while to be at the expense of cultivating flinty and hornwood, as some speculators have proposed, for the sake of the alkali contained in their ashes.

The varieties of pot and pearlash, which are found in the markets, would no doubt on analysis afford very different results, especially with regard to the proportions of earthy matter, of water, and of carbonic acid; it is not therefore perhaps much to be regretted that we possess no very accurate analysis of any of them. The only one on which any reliance can be placed, is of Dantzic pearlash by Mr. Kirwan, in which are contained about

<table>
<thead>
<tr>
<th>Substance</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Potash</td>
<td>60.3</td>
</tr>
<tr>
<td>Carbonic acid</td>
<td>22.4</td>
</tr>
<tr>
<td>Water</td>
<td>7.2</td>
</tr>
<tr>
<td>Sulphated potash</td>
<td>8.7</td>
</tr>
<tr>
<td>Muriated ditto</td>
<td>0.7</td>
</tr>
<tr>
<td>Earth</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

But if the analysis of any particular sample is of little consequence, generally speaking, yet it is of considerable importance both to the manufacturer and chemist to be in possession of a compendious and accurate mode of ascertaining the contents of the various kinds of pot and pearlash, in order to make advantageous purchases of articles, in the intrinsic worth of which there is so much difference. Upon the whole perhaps the best mode of proceeding on such occasions is as follows.

11. Prepare a diluted sulphuric acid, by mixing the concentrated acid, called oil of vitriol, with three times its bulk of distilled water. Then test it by taking 100 grains of the diluted acid, and adding muriat of barytes as long as any precipitate falls down. The sulphat of barytes thus prepared, when washed with cold water and dried at a low red heat, contains 33.3 per cent, of sulphuric acid; hence the real acid in any quantity of the diluted acid is readily ascertained.

12. Pulverize 500 grains of the alkali under examination, and digest it in warm distilled or rain-water, adding fresh portions of this fluid as long as any thing is diffusible. Then put all the solutions together, and drop in the teled sulphuric acid from a vial containing a known weight of the fame, till the slightest possible excess of acid is indicated by a paper tinged with litmus. After this, heat the liquor to expel all the carbonic acid, and if the liquor changes the colour of turmeric paper, add a few more drops of sulphuric acid, till it ceases to show an excess of alkali. Now weigh the vial of sulphuric acid, and thus ascertain how much has been expended in faturating the alkali, and for every 100 parts of real acid (as previously determined by muriat of barytes) thus employed, set down 121.2 of pure potash. The alkali being the part which gives value to the whole, this is all the examination which in ordinary cafes is required; but if the analysis is to be carried further,

3d. Take 500 grains more of the alkali, dilute it in boiling water, and pour the filtered solution into a flask; then place the flask and a vial containing about three ounces of pure and moderately strong nitric acid into the same feale of an accurate balance, and equipsode them. Afterwards add the acid, drop by drop, to the alkali as long as any effervescence takes place, and the loss of weight indicates the amount of carbonic acid absorbed. The solution will now probably be crystallized; a sufficient quantity of diffused acid will therefore be added in order to diffusle the crystals, and nitrat of barytes is to be dropped in as long as any precipitate takes place: 100 parts of the dried sulphat of barytes, thus procured, indicate 73.6 of sulphated potash. This being removed, add muriat of silver to the clear liquor till it ceases to be decomposed: 100 parts of muriated silver gave 41.34 of muriated potash. Thus the saline contents are all ascertained; viz. potash, carbonic acid, sulphat, and muriat of potash. The earthly part is shown by the insoluble residue.

Having now treated of the impure subcarbonats of potash, we shall conclude this article by an account of the purer subcarbonats, and the perfect carbonat of potash.

The most important of the purer subcarbonats is salt of tartar; which is prepared in the wine countries in large quantities, and is the kind generally used in medicine. The lees of wine and the tartar that is deposited on the sides of the casks, are put into small bags about a foot long, and subjected to a strong pressure, in order to squeeze out all the wine, which is disposed of to the brandy distillers; the contents of the bags being carefully taken out without breaking form maffes like leaves, which are dried in the sun, and then piled up in a furnace with alternate strata of charcoal. The fire being kindled and the draft properly regulated, the acid and inflammable matter of the tartar are burnt off without fusing the alkaline part; when the process therefore is finished, these leaves remain of nearly the same size as before, but very porous and perfectly white. Being then broken into pieces they are diffusled in hot water, and the clear lixivium being evaporated to dryness, and calcined to whiteneis, is ready for sale; 3/5 parts of tartar yield one of salt of tartar.

A more expeditious but less economical way of procuring salt of tartar, is to mix equal parts of crude tartar and nitre, and project the mixture into a red-hot crucible. A rapid defagration takes place: the nitric acid and the combustible parts of the tartar mutually decompose each other, and there remains behind the alkaline base of each united with some carbonic acid. This preparation is called white flux, nitre fixed by tartar, extemporaneous potash.

The perfectly faturated carbonat of potash has not been known to chemists longer than from the time of Bergman. It may be prepared in two ways: the first, which was discovered by Berthollet, is as follows. Take equal parts of salt of tartar and carbonat of ammonia, diffusle the whole in warm water, pour it into a retort, and proceed to flow diffusion; the potash having a stronger affinity for carbonic acid than ammonia has, deprives this latter of its acid, and in consequence ammoniacal vapour is given out in great quantity: when this ceases, the contents of the retort are to be poured into a convenient vessel, where by refrigeration a copious deposition of crystallized carbonat of potash will take place.

The other method, and that which is generally practised, is to put a solution of salt of tartar into an apparatus for impregnating water with carbonic acid, and then to throw in this acid till the alkali is quite saturated and refuses to take up any more.

The form of the crystals of carbonat of potash is that of a tetrahedral rhomboid with dihedral summits. This salt requires
CARBONAT.

requires for its solution about four parts by weight of cold water, but no more than $\frac{4}{9}$ of its weight of boiling water: a considerable degree of cold is produced during its solution. It is hardly at all soluble in cold alcohol, and requires above 200 parts of this fluid when boiling for its complete solution.

It has been analysed by both Bergman and Pelletier; each of these chemists in the proportion of alkali, but they differ materially in their estimation of the water and carbonic acid.

<table>
<thead>
<tr>
<th></th>
<th>Bergman.</th>
<th>Pelletier.</th>
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<tbody>
<tr>
<td>45</td>
<td>48</td>
<td>48 potash</td>
</tr>
<tr>
<td>20</td>
<td>43</td>
<td>carbonic acid</td>
</tr>
<tr>
<td>32</td>
<td>9</td>
<td>water</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
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The taste of this salt is cool and fresh, with hardly any of the alkaline flavour; on which account, because it is fully saturated with carbonic acid, it is greatly preferable to salt of tartar in the composition of effervescing draughts, and for other medical purposes. It is neither effervescent nor deluguecent in the air. It is decomposable with abstraction of the acid by barytes, lime, and flour, and with abstraction of the alkali by all the mineral, and by most of the vegetable acids.

The uses of potash are innumerable. It is consumed in the greatest quantities by soap-boilers, bleachers, and glass-makers. In the laboratory it is in constant and indispensable service.

CARBONAT OF SODA. Kelp. Barilla. Natron. This salt is found to exist both in the vegetable and mineral kingdoms of nature. When mineral, it is met with either diluted in the water of certain hot springs, as those of Carlsbad in Bohemia; or of certain lakes, as the natron lakes of Egypt and Hungary; or it occurs in the state of a fossil-salt, as in the fossil natron of Tripoli, called trona. In the vegetable kingdom carbonat of soda has been found to exist, ready formed, in the Saltila soda, and in all probability is contained in all those succulent saline plants that grow in places impregnated with muriat of soda. In order to supply the vast demands for this alkaline salt, it is procured from both the sources above mentioned, by processes which we shall now relate, beginning with the mineral soda.

There are two varieties of mineral soda, the triturated and compact. The triturated has been hitherto procured only from Africa. It is found between Tripoli and Fezzan, forming a very thin limatium just below the surface of the soil. It is of a triturated crystalline texture, somewhat resembling fibrous pumice. It is collected to the annual amount of some hundred tons, but fearfully ever finds its way to the European markets. It is distinguished from common carbonat of soda, by being fully saturated with carbonic acid, by containing only a small quantity of water of crystallization, and by not efflorescing on exposure to the air. Its component parts, according to Klaproth, are

<table>
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<tr>
<th></th>
<th>37. foda</th>
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<tbody>
<tr>
<td>38.</td>
<td>carbonic acid</td>
</tr>
<tr>
<td>22.5</td>
<td>water</td>
</tr>
<tr>
<td>2.5</td>
<td>sulphated soda</td>
</tr>
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<td>100.0</td>
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The compact mineral soda is procured in quantity only from Egypt and Hungary. The Egyptian natron lakes, six in number, are situated in a barren valley, about 30 miles westward of the Delta. During three months in the year they are supplied with water from copious springs, but as they receive no water during the rest of the year, some of the smaller and shallowest ones are generally dried up during the summer. The boil consists of limestone mixed with pumice, and for the most part covered over with mud. The lakes contained in these lakes are mineral and carbonat of soda, of which the former is deposited for the most part on the deeper side, while the latter is formed among the rushes that grow in the shallower places. The natron appears to be produced by the slow natural decomposition of the limestone and common salt, sifted by the rushes; the soda on their surface suffices its proper quantity of water, and forms a confoundedly crystallized film of the thickness of from one to twelve inches according as the weather and other circumstances are more or less favourable. The efflorescences on the surface of the lakes and the detached crystals that form at the water's edge are mixed with a much smaller quantity of salt than the larger maffles; these latter however being more convenient to carry, and being procured with the least trouble, are confoundly preferred, and as no subsequent purification is had recourse to, the natron of Egypt is by no means so valuable as it might easily be made. It is chiefly exported to Greece and other parts of Turkey, also to Venice, France, and Britain.

The chief natron lakes of Hungary are four in number, situated between Debritz and Grosswaren. These, in the winter season, when full of water, are from one to two miles in circumference, but by the middle of April or the beginning of May they are generally dried up, except some pits that have been sunk by art below the general level. In a few days after the water has disappeared, the whole surface of the cavity becomes white with saline efflorescences of natron mixed with sulphat of soda; these being removed, a fresh crystallization is formed in three or four days, and continues to be renewed with equal rapidity during the whole dry season of the year. A very heavy shower is sufficient to fill the lakes, but in a day or two they are dry again, so that no very material interruption is experienced till the latter end of October: by this time the water in the pits is fully saturated with natron, a considerable proportion of which crystallizes during the first frosts of winter, and thus terminates the harvest for the year; for after this the rains set in, and the lakes continue full of water till the ensuing spring. The Hungarian as well as the Egyptian natron seems to be brought into commerce without undergoing any preparation, as it appears in pulverulent maffles of a dirty grey colour. The Hungarian natron has been analyzed by Lampadius, and the Egyptian by Klaproth, with the following results:

<table>
<thead>
<tr>
<th>Egyptian.</th>
<th>Hungarian.</th>
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<tr>
<td>32.0</td>
<td>14.2 carbonat of soda.</td>
</tr>
<tr>
<td>20.8</td>
<td>9.2 sulphat of soda</td>
</tr>
<tr>
<td>15.</td>
<td>22.4 muriat of soda</td>
</tr>
<tr>
<td>31.6</td>
<td>45. water</td>
</tr>
<tr>
<td>9.2</td>
<td>9.2 earth</td>
</tr>
</tbody>
</table>

| 100.0     | 100.0 |

By far the greater part, however, of the soda that is employed, is of vegetable origin, and, like pot-ash, is procured from the combustion of plants. While the vegetables that grow in common soil yield pot-ash, those which flourish in salt water, or on the sea-shore, or wherever the soil is strongly impregnated with salt, yield soda. Of vegetable soda there are two varieties, viz. barilla and kelp, the 3 U 2 formen
CARBONAT.

former being made from the plants of the genera Saliola, Silicoria, &c. that grow on the sea-shore; the latter being the product of fuci, and other marine plants.

The belt barilla (properly batiglia) is made from the Saliola souda, which is an object of sedulous and extensive cultivation to the Spaniards on the shores of the Mediterranean, especially in the vicinity of Alicante. It is found in light low folds, that are embanked on the side next the sea, and furnished with flood-gates, by which the salt water may be occasionally admitted. In autumn, when the seeds are ripe, the crop is cut down and dried; the seeds are rubbed out, and the rest of the plant is burnt in very simple furnaces, the temperature of which is just high enough to cause the ashes to enter into a state of semi-fusion, and coalesce into compact cellular masses. The most esteemed variety of this salt is called "fetta batilla;" it is of a greyish-blue colour, and is covered over with a saline efflorescence, when exposed for a time to the air; it is exceedingly hard, and when applied to the tongue discovers a sharp, pungent, alkaline flavour.

Kelp is made of what is vulgarly called sea-weed, or sea-wrack (whereas the French term, fonds de varech), that is, of some of the leafy fuci, principally the Serratus and Velascifisa, as grow on rocks in the sea, between the high and low water mark. The most favourable situation for these plants is a sheltered bay, full of calcareous rocks. The reason for gathering the plants is from May to August. On the British coasts they are cut with a fythe, as close to the rock as possible, and then bound up into large bundles, which being fastened to one end of a long rope, the other extremity of which is tied to a boat, and thus the labour of two or three men is capable of towing several tons weight to the shore. These bundles, when landed, are to be opened, and their contents spread thinly on the shore to dry, turning them from time to time, lest they should ferment, by which both the quantity and quality of the kelp would be greatly deteriorated. The ware, when dry, should be sacked securely from rain for a few weeks, till it becomes covered with a white saline efflorescence, and then it is ready to be burnt. The furnace employed for this purpose used to be, and in many parts still is, nothing but a round pit, three or four feet deep, and seven or eight feet across, lined with stones; the more skilful kelp-burners, however, make use of a kiln of the following construction.

It is built of stone, in the shape of a long open coffer, being 28 inches wide in the clear, above 3 feet high, and from 8 to 18 feet long. The bottom of the kiln being covered with brushwood or heath, a thin stratum of the dried ware is shaken lightly upon it, and fire is applied to the leeward side of the kiln. It must now be supplied with fresh ware, thrown lightly on, whenever the combustion reaches the surface; if the weather be perfectly clear, no other precautions are required, than to take care that the fire be not flitted, but if it blows ever so little, the windward side of the kiln must be covered with sods, and even both fides, if the weather is at all boisterous. When all the ware has been thrown on that is intended to be used at one time, care must be taken to cover every spot where the fire reaches the surface, with a little of the charred or least burnt part. After a time, that part of the masses which is nearest to the fides is seen to soften or melt, and now begins the most critical period of the whole process. An iron bar, previously heated, is to be introduced among the soft matter, which by this means is to be slowly filleted and incorporated, adding by degrees some of the less burnt portions, and in this manner the whole is to be kneaded together till it becomes a pasty semi-fluid mass. It is a matter of considerablc dexterity so to perform this process as to be able to mix the dust and fragments of a preceding burning, without too much cooling the whole. If when this incorporation of the materials is begun the masses are too hard and dry, by waiting a short time, it will be found to have acquired the necessary temper, but if it is dry and pulvcrulent like ashes, it is expedient to have recourse to a little common salt, which, acting as a flux, will begin the fusion; or if the heat is very languid, a little pulverized brindstone may be made use of. When the kelp has been thus prepared, and is grown cold, it is broken into large lumps and is fit for sale. Well made kelp is of a bluish-grey colour, sometimes approaching to green; it has more or less of a cellular texture, and contains pieces of charcoal enveloped in the mass; when breathed on, it emits a faint fulphurous odour; to the taste it is caustic and alkaline, mixed with the flavour of common salt. It yields easily to the knife, but poffefles a considerable degree of toughness. If dry, it is usually covered with a white saline efflorescence. The proportion of pure souda which it contains varies, according to Kirwan and Janieton, from 12.4 to 17.5 per cent.

Pure carbonated soda, from whatever substance, and by whatever means it is procured, is essentially the same. Its usual state is that of clear colourless crystals, in the form of rhomboidal octahedrons, or oblique tetrahedral prisms. To the taste it is sweeter, cooler, and more alkaline. It is soluble in 21 times its weight of water at 59°, and at a boiling heat dissolves in its own water of crystallization. By expouing to the air, it effloresces and is converted into a white mealy powder, with the Leeds of the prettist part of its water, and this powder, when kept for some time at a low rod heat, concretes into lumps, loses a small portion of its carbonic acid, and all its water, and is then called defecated soda. The component parts of crystallized carbonat of soda have been variously estimated, though the difference has not been very great. We shall mention the proportions as given by Bergman, and those adhered to by Mr. Kirwan.

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<td>Berg.</td>
<td>Kirw.</td>
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<td></td>
<td></td>
<td>22.</td>
<td>21.58 soda</td>
<td>16.</td>
<td>14.42 carbonic acid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>62.</td>
<td>64.</td>
<td>water</td>
<td></td>
</tr>
<tr>
<td>105.</td>
<td>105.60</td>
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Soda, however, is capable of combining with a larger proportion of carbonic acid by dissolving the crystallized carbonat in water, and then throwing in carbonic acid gas. The crystals that are now deposited will be found to contain a considerably less quantity of water, and their sweetish subalkaline flavour will be changed for a cooling saline one; so that in this state it resembles the trona. It has not, however, been analysed with such accuracy as to enable us to state the proportions of its ingredients.

Carbonated soda is decomposed with absorption of its bafe by almost all the other acids, and with absorption of its acid by barytes, lime, fromont, and potash.

The purposes to which carbonated souda is applied are in general the same as those for which carbonat of potash is used; the circumstances that induce the occasional preference of one to the other will be mentioned in their proper places.

CARBONAT of Barites. This compound is both found native, and may be procured artifically. For the mineralogical description of the native barites, see Withers; and for the way of procuring the artificial carbonat, see Barytes.

The artificial carbonat appears, from the analyses of Klagroth and Pelletier, to be composed (when dried and ignited)
in five parts of water, add to this a pound of good carbonate of potash, dissolved in a like quantity of water, and let them for a few minutes. A copious white precipitate is produced immediately, which renders the whole mixture very thick. Strain it, while hot, through linen, and wash the white mass left on the flannel repeatedly with boiling water pounded on it, till the clear filtered water drops through quite turbid.

Then dry the precipitate over a fire, and a white tabular powder is left, which is the common magnesia. The drying of this precipitate is extremely tedious, for being of a very light fusable nature, it holds a large quantity of water without dropping, and consequently the filter thus becomes useless. In the large way the wet mass is laid laid on large flasks of chalk, which suck up much of the moisture very expeditiously.

Common carbonate of magnesia, in its pulverulent state, is excessively light, and lies loose, so that a smaller weight of it will fill a bottle of a given size than about any other known powder. It consists of water, carbonate of a magnesia, in proportions, somewhat varying. The quantities of each have been thus estimated: by calculation, in cold red heat, for about half an hour, both the water and the carbonate acid is expelled, and the loss amounts on an average to about 25 per cent. On the other hand, 100 parts of the same carbonate lose by solution in acids only 34 parts, which are carbon acid, and hence the compositions of 100 parts of the carbonate will be 34 of carbonate acid, 21 of water, and 45 of magnesia.

The calculation of this carbonate is easy, compared to that of lime, and in the process it throws to a very small bulk, and becomes somewhat harsh to the feel. When quite freed from water and carbonate acid, the pure magnesia that remains is the Magnesia flu at the slips, which fee.

The quantity of alkali directed for the decomposition of the sulphate of magnesia is somewhat more than necessary for the purpose, so that the clear liquor that first comes off through the filter is a solution of sulphate of potash with carbonate of potash.

Another form or species of carbonate of magnesia is that in which the earth is fully saturated with carbonate acid, forming a crystallizable salt. It is very soluble in water, whereas the common pulvcrulent carbonate of magnesia is absolutely insoluble in pure water.

The crystallized species is formed in two ways. It is produced by mixing the same materials as the common carbonate, but without applying heat. The excess of carbonate acid, which the heat drives off, remains in this case united with a portion of the magnesia, and if this is thrown into spontaneous evaporation, a quantity of small long four-sided prismatic crystals may be picked out of the crystals of sulphate of potash, which are the crystallized carbonate of magnesia. But a neater and better way of preparing them is to pass a stream of carbonate acid through water rendered milky by the common magnesia, which will be seen gradually to become clear, owing to the solution of the earth in the carbonate acid and water, after which let the solution evaporate slowly in a warm room. The crystals will then form readily, or even if the solution is pretty strong, they will deposit by mere reet for a time.

This salt consists, according to Bergman, of about 25 of magnesia, 50 of carbonate acid, and 25 of water, when analyzed as the former carbonate. It is soluble in 48 parts of cold water, but in much less when the water also has an excess of carbonate acid, and hence it is often found during the slow evaporation of many of the carbonated mineral waters.

Carbonated magnesia, in any state, is decomposed by potash, soda, barytes, lime, and triontian, and also by all the salts, with the baits of these three earths. Ammonia and magnesia...
magnesia seem to have nearly equal affinities for carbonic
acid, so that either of the two will only partially decom-
pose the fat carbonated of the other substance. Thus,
if pure ammonia be added to the crystallized magnesium
carbonate, the precipitate is not pure magnesia, but the
fus-carbonat, or common magnesia; and on the other hand,
the same sub-carbonat is produced, if pure magnesia be
added to carbonat of ammonia. In either case also a part
of the ammonia unites with the magnesia and carbonic acid,
as Pouerecy has observed forming a triple salt, the ammo-
niaco-carbonat carbonat.

Carbonate of Alumina, Glycine, Zircom, &c. &c. For the
remaining earthly carbonates, see the respective earths.

Carbonates (Metallic). See the respective metals.
Carbonate of Lime, in Agriculture, a term applied to lime
in a state of combination with carbonic acid. This sort of
union is frequently met with in nature, and extends to all
the flouy subfstances which are distinguished under the title
calcareous, such as lime-flone, chalk, marble, &c. In burn-
ing or converting these subfstances into lime, they are de-
prived of their carbonic acid or fixed air; but on cooling
begin to absorb it again from the surrounding atmosphere.
See Lime.

Lime, when in the state of a carbonate, is frequently
termed effete lime, and may often be employed for the pur-
oposes of agriculture with much greater benefit than in its
calcie state, or that of quick-lime.

Carbonat Blanc, in Geography, a town of France, in
the department of Girone, and chief place of a canton, in
the district of Bourdeaus. The place contains 1800, and the
canton 16,503 inhabitants: the territory comprehends 244
kilometres, and 20 communes.

Carbon, a small river of Spain, which runs into the
Guadalquiver, a little above Seville.

Carbonelli, Stefano, in Biography, an Italian per-
former on the violin, brought into England by the duke of
Rutland, about the year 1720. He had been a scholar of Cor-
elli, and was said to play much in his manner. His hand
was not brilliant, but had a good tone, and knew music well;
as a book of 12 fodies, which he dedicated to his patron, the
duke of Rutland, testified: the first had a double-stopped
fugue in each, and the rest had pleasing melodies in correct
and judicious counterpoint; nor were they deficient of in-
vention, as far as his ideas and hand could carry him. We
have seen the book, which would be now difficult to find.
It is a folio, engraved on copper.

In 1722, he had a benefit concert at Drury-lane theatre,
of which the bill of fare is minutely given in the Daily
Contra: (see Hilt, Mus. iv. 648.) by which we may judge
of the musical dainties of the season.

Carboni was a lively and judicious leader, and, on his
arrival in England, was placed at the head of the Opera
orchestra, where he continued to lead, till 1725, when he
resigned, and was engaged by Mr. Fleetwood at Drury-lane,
and there played concertos in the second musics, and fre-
quently solos between the acts. But he resigned this station
when Handel began to perform oratorios, in which he con-
tinued to lead as long as their great author survived. Late
in life, relinquishing music as a profession, he entered into
the wine trade, and established a house, which still subsists.
He was a man of worth and probity, and honoured with
general esteem for his private virtues as well as his profes-
sional talent. While he led the band at Drury-lane, for
Richard Steel, in his comedy of The Confessing Lovers, in-
trouded him to play a solo for the amuement of Indiana,
taking occasion, after his departure, to make

Devil jun. pay him and men of talents many compliments.
He died in 1772.

Carbon, in Geography, a town of Naples, in the pro-
vince of Belfasta; 16 miles S.W. of Turin.

Carbonic Acid, Carbonic Acid Gas, or Fixed
Acid.—Aerol acid.—Mephitic acid.—Kohlenuaure, Germ.
—Acide carbonique, Fr. in Chemistry.

Carbonic acid, in its uncombined state, is only known to
us as a gas, and it is the first gas in which acid properties
were clearly discovered. It is known to be so by reducing
certain vegetable blues, by neutralizing alkalies and alkaline
earts, and by being formed by the union of a combustible
base. The sources of this acid are immense, and widely diffused.
The chief are the following.

1. The atmosphere always contains a small portion,
which varies in the immediate vicinity of places where
the precipes of respiration and combustion are going on, though
somewhat less than might be expected. The general
average is estimated at about one hundredth part. It is readily
extracted from a confined portion of the atmosphere by the
contact of lime or the calcie alcalies.

2. Almost every natural spring, as it rises from the earth,
contains a portion of this air; and some waters hold it large
portion as to give them, when exptosed to the air, a very
brill, frothy appearance, and a very sensible taste and
decidedly acid properties. The celebrated springs of Spa, Pyrmont, and Saltzer, are of this kind, and the most
highly-carbonated water of them contains about its own
bulk of the gas.

3. Every poctus in which coal, wood, or any other car-
bonaceous substance is burnt, is one which generates this
acid gas. The fame may be said of the prociss of respi-
ration.

4. The vegetation of plants under some circumstances
generates carbonic acid.

5. The spontaneous decomposition of vegetable and
animal matter produces this gas in abundance; hence fer-
mentation and putrefaction are carbonating processes.

6. But the largest store of carbonic acid that exists is that
enormous quantity which is solidified in all the inmemel beds
of lime-flone, chalk, and calcareous flones with which every
part of the globe abounds. Many of these contain 40 per
cent. or even more of their weight of this acid.

Carbonic acid gas, or fixed air, has the following proper-
ties. It is permanently gaseous at any temperature or
pressure. It is fatal to animal life, any living creature im-
mered in it perishing as soon as it would by total interrup-
tion of respiration. Hence the small, warm-blooded ani-
mal die in it almost immediately; dogs, and animals of
bulk, spредily become senseless in it, but recover, if removed
in a short time; frogs, and cold-blooded animals, lie in it
for a considerable time, owing to their power of subdivis-
ing for a time without external respiration; but when this is paft
they perish as the warm-blooded animals. This air is equally
in capable of maintaining combustion, so that a candle let
down into a jar of it is extinguished as soon as it enters
the gas as effectually as if dipped into water. Even the ad-
mixture of so small a proportion as one-ninth of carbonic
acid gas renders common air unable to maintain combination,
according to Mr. Cavendish’s experiments. It is the heaviest
of all the known gases, except the sulphureous. Hence, as
soon as generated, it falls through the atmosphere to the
lowest places, unless mingled with it by agitation or long
standing. Thus, if a jar of fixed air is inverted from some
little height over a burning taper, enough of it falls unmixed
upon the taper to extinguish it. The weight of this gas is,
in all circumstances of pressure and temperature, to that of common air very nearly as three to two; hence its specific gravity will be about 0.91850, and the weight of a cubic inch at 63° therm and 29.5 inch bar, will be about .456 of a grain.

This gas also combines readily with water and many other substances, as will be presently mentioned. Its combinations with the alkalites, earths, and metals, are called carbonates.

Carbonic acid gas, for experiment, generally from lime-dust, chalk, marble, or any carbonat of lime, either by heat or by the action of an acid, almost any of which will disdodge the carbonat from its bases, and cause it to assume a gaseous form. The mild alkalites may also be used for this purpose. The action of acids always produces an effervescence, or frothing at the surfaces of contact, owing to the rapidity with which the carbonic acid takes the form of a gas; and hence all those that effervesce with acids may be presumed (but with few exceptions), to confide chiefly of carbonat of lime. To obtain carbonic acid gas in quantity and in a regular, uniform stream, put a number of small lumps of marble or calcareous spar in any proper vessel, pour on them sulphuric or rather muriatic acid diluted, and receive the gas as it is generated. If it is collected over water, same will be lost at first, owing to the absorption of a portion by the water itself. Or, else, put some dry chalk or marble, or especially carbonat of magnesia, in an earthen retort and heat it to redness. The carbonic acid gas then comes off in abundance. When decomposed by acids, a grain of marble will yield nearly a cubic inch of gas.

As all mixtures under the inonous fermentation, give out an abundance of this gas, this affords a ready way for procuring it, and substances under experiment may be immersed in an atmosphere of the gas by being simply suspended over the fermenting vats of brewhousens.

Carbonic acid gas is readily absorbed by water; and the natural carbonated waters may be easily imitated. This fluid has a pungent, agreeable, brilk taste, and bubbles vigorously, when exposed to air, the more in proportion to the temperature. This abstraction is shown in a very easy manner, simply by filling a phial with it, then displacing about half its contents, by throwing up the gas, and then prefling the finger close against the mouth, shaking the half-full bottle violently. It will then absorb so much of the gas as to make nearly a vacuum within, which will be felt by a strong external pressure of the atmosphere on the finger that shuts the communication. This abstraction is also equally promoted by subjecling the gas to strong pressure, when in contact with the water that is to absorb it; and it is by the united action of pressure and agitation that the manufacture of the carbonated medicinal waters (such as the artificial Seltzer, and the like), is carried to such great perfection.

Water, at about 50° temperature, will absorb, by mere agitation, nearly its own bulk of carbonic acid gas; but by the combined action of pressure and agitation, three times as much may be thrown in.

Mr. William Henry, in his valuable experiments on the absorption of gasses by water, (Phil. Trans., for 1803;) has shewn that the quantity of gas absorbed is (ceteris paribus), regulated by the purity of the gas; for, even if the gas itself is obtained unmixed with any other, some addition of atmospheric air must take place from the vessels in which the experiment is made, and also from the water, which cannot be absolutely purged of common air by boiling or any other method. Hence Mr. Henry found, that if 20 measures of nearly pure carbonic acid gas were agitated with 10 measures of water, full 10 measures of the gas would be absorbed;

but if 20 of the gas, mixed with 19 of common air, were agitated with the same quantity of water, only 6 measures could be taken up. Water also parts with a great proportion of its carbonic acid by mere exposure to air, and is independent of the circumstance of removing the mechanical preflure of corks, &c.; for Dr. Browne found, that the gas would not escape from Seltzer water, when in a bottle, though a loose empty bladder supplied the place of a cork, and in which, therefore, the gas had ample room to expand itself; but a free communication with the air was necessary for this escape. The abstraction of the gas is inversely as the temperature of the water; cold water absorbing much more than warm. The diminution of absorption, on raising the heat. Mr. Henry estimates at about 7/100th of the whole for every ten degrees above 55°.

With regard to the effect of pressure, it appears that water, in all cases, takes up as great a bulk of condensed as of expanded gas, under similar circumstances of temperature.

Therefore, as the bulk of all aëroniform bodies is inversely as the pressure to which they are exposed, the quantity absorbed is directly as the pressure; that is, for example, if a pressure of 30 inches of mercury will cause a certain bulk of carbonic acid to be absorbed, a pressure of 40 inches will cause a double absorption.

The specific gravity of water, holding its own bulk of carbonic acid, is about 1.0015. This gas is readily and almost totally again expelled by heat; hence, in the analysis of mineral waters, the first step to be in general pursued is the expulsion of the gasses which it may contain, by boiling for about ten or fifteen minutes.

Carbonated water shows its acid properties by changing the colour of litmus from blue to red. This it will do, according to Bergman, when the water contains as much as 1/10th of its bulk of the gas. It is very conveniently shown, in the way mentioned by Kirwan, that is, by adding, in a thin glass tube, or jar, about equal quantities of the carbonated water, and of litmus infusion diluted, so that the blue is just distinguishable. The colour then becomes of a very dilute red, and is better remarked when compared with a similar glass tube full of the same diluted litmus liquor and plain water.

To show how the carbonic acid and no other acid that produces this change, let some of the carbonated water be boiled strongly for a few minutes, and then it will leave the blue unaltered.

But lime-water is a much more delicate test for carbonic acid, either gaseous or liquid. When a gas is to be tried, nothing more is required than to shake it with lime-water, or with barytic or silicious water, and the immediate miliness of the water will indicate the presence of carbonic acid gas in almost every case.

But with liquid carbonated water, it should be remembered, that though the first portion of carbonic acid will precipitate the lime from its solution in the form of white carbonat of lime or chalk, a greater portion of the acid will re-dissolve the carbonat of lime. So that if a highly carbonated water and lime-water be mixed together at repeated portions, the mixture will first become turbid by the separation of the carbonat of lime; then an additional quantity of carbonated water will make it again clear by re-dissolving the carbonat; after which another portion of lime-water will again make it turbid, and fresh carbonated water again clear, and so on, in proportion to the mutual saturation and super saturation of the two ingredients. Therefore, as no error can arise from an excess of lime-water, the latter, to shew, in all cases, the presence of carbonic acid, should be in equal quantity with the carbonated water. According to Bergman's valuable researches on carbonic (called by him aerial) acid,
CARBONIC ACID.

acid, lime-water will detect by its cloudiness as little as one cubic inch of the gas in 7000 grains of water, that is, where the weight of the gas is only 1/7500th of the whole.

This gas is also readily and totally absorbed from any gaseous mixture by light agitation with a solution of caustic or nearly caustic alkali. A much smaller quantity of alkali solution will suffice than of lime-water, as the former may be made much more concentrated. This is often convenient; but it is not so palpable a test, as no cloudiness or change of appearance in the alkaline solution indicates.

Carbonic acid, according to the modern system of nomenclature, signifies an acid whose bases is carbon, and hence that it is produced by the combustion or oxygenation of carbon or pure charcoal. It required the united efforts of many of the most eminent chemists to elucidate the nature of this important acid, and to shew that the very same substance which exhaled as a large component part of all calcareous floures, and was given off abundantly by many of the natural mineral waters, was also the sole product of the combination of charcoal, and all carbaneous matters. The full discovery and proof of this fact are due to Lavoisier, who made the elementary experiment of burning a given weight of charcoal in oxygen gas of known purity, (no other substance being introduced than a very minute portion of phosphorus to begin the combustion,) and found the product of the combustion to be this acid gas, the weight of which, when removed by caustic alkali, corresponded very exactly with the loss of charcoal and oxygen. Very little actual diminution of bulk takes place at first in this combustion, since the product is itself a gas, and not a liquid, as happens after the combustion of sulphur, phosphorus, &c. and therefore it is not till caustic alkali or lime-water is introduced that the production of the carbonic acid, and consequent loss of oxygen, are made apparent. From this elementary experiment, Lavoisier infers, that carbonic acid is composed of about 28, by weight, of charcoal, and 72 of oxygen, and the results of subsequent inquiries nearly, if not absolutely, confirm the accuracy of this statement.

Carbonic acid is at its highest state of oxygenation, and is the only state in which it has acid properties. United with left oxygen it forms the carbonous oxyd as noticed in the last article, in which also, the partial disoxygination of carbonic acid and consequent production of the carbonous oxdy are described.

Carbonic acid has been completely disoxyginated (that is, reduced to black pulverulent charcoal) by only one substance, namely, by phosphorus. This discovery was made by Mr. Tennant, and was followed by other valuable experiments by Dr. Pearson. (Phil. Tranf. for 1791-2.)

From the well known fact that phosphorus cannot be made by distilling phophat of lime and charcoal, the latter not having the power of decomposing this acid when united with lime, Mr. T. inferred that the united actions of phosphorus and lime might be sufficient to decompose carbonic acid by a stronger affinity with its oxygen. He accordingly put some phosphorus into a costed glass tube closed at one end, and over the phosphorus some powdered marble. The open end of the tube was then also clased, except a very small aperture, to prevent the free access of the external air, and the tube was then heated red hot for a few minutes. When cold and broken it was found to contain a black powder consisting of true charcoal mixed with both phophat and phophurate of lime, together with some undecomposed marble. In another experiment the only source of the black carbonaceous powder can be the carbonic acid of the marble, which appears to have been decomposed by complicated affinities, namely by that of part of the phosphorus for the oxygen of the carbonic acid, of the rest of the phosphorus for the lime forming the phophat of lime, and also by the phophoric acid (as fom as formed) for another portion of the lime forming the phophat of lime. Or, in other words, the carbonat of lime must undergo two different processes before the charcoal can be produced, namely, the carbonic acid must be separated from the lime to which it has a certain affinity, and also the oxygen of the carbonic acid must be separated from the carbon which is its base. The lime described from its union with the phophoric acid by the united affinities of part of the phophorus for lime, and also of the phophoric acid, when formed, for the lime. On the other hand, the carbonic acid is decomposed by the direct affinity of phophorus for oxygen, which is great, but however of itself less than that of carbon for oxygen, since, in the common distillation of phophorus, it is produced by decomposing phophoric acid with charcoal. Therefore the decomposition of carbonic acid here produced is the result of combined affinities, and could only be effected in this manner.

Dr. Pearson decomposed carbonic acid by a similar process, but with phophorus and carbon: of soda instead of carbonat of lime. Sufficient quantity of the black powder was procured in both cases to prove that it was genuine charcoal, and yielded carbonic acid again on combustion with nitre.

Many liquids absorb carbonic acid with apparently as much ease as water, such as alcohol, oil, &c. but such mixtures seem to produce no remarkable chemical change.

The affinity of carbonic acid with the alkalis, earths, and metals, is so weak that it may be displaced by every other acid, the boracic excepted. This weakness of affinity is doubtless much owing to the tendency which it has to affume a gaseous form as soon as it is enganged.

The order of the affinities of this acid in the liquid way for the alkalis and earths is boracic, carbon, lime, potash, soda, magnesia, and ammonia. With regard to the two latter indeed, the force of affinity is nearly balanced that each substance will partially decompose the carbonat of the other according to the temperature. Thus at a higher heat the ammonia, from its increased tendency to volatilization, loses much of its force of affinity with solid or liquid haifes, and then its carbonat is decomposed by magnesia, and yields carbonic acid again, and has the ammoniacal carbonat, though very imperfectly.

As the carbonic acid quits every subsistance in a high heat its relative affinities in the dry way cannot be ascertained.

CARBONIC acid, in Agriculture, an acid that abounds in nature, and is mostly found in the form of an aeriform fluid, or gas. See CARBONIC acid.

The author of the "Philosophy of Gardening," remarks, "that when vegetable substances are decomposed by fermentation, there is a quick union of oxygen and carbon; and this carbonic acid, called formerly fixed air, rises up in vapour, and flies away. But where this process goes on more slowly, as in a dunghill lately turned over, or in black garden mould lately turned over and thus exposed to the air; much of which remains in the cells, or cavities of the hot-bed, or border, this carbonic acid is slowly produced, and is absorbed by vegetable roots, he supposes, in its fluid state, or diffused in water before it acquires so much height as to fly in the atmosphere, or form of gas. This carbonic acid, when in its fluid state, or diffused in water, not in its aerial or gaseous state, is, he conceives, the principal food of plants; because their solid fibres consist principally of carbon, and their fluids of water, as is evident from their analysis."
CARBONIC earth, or salt, that sort of earth, or salt, in which there is a considerable portion of decayed vegetable matter. Boggy and other wet kinds of lands on which any decayed vegetable productions have been suffered annually to become putrid, are fairly of this kind; and likewise much ground as has been much enriched by manures, such as those of old gardens. The surface stratum of lands in general partakes of this nature. See CARBON.

CARBONNE, in Geography, a town of France, in the department of the Upper Garonne, and chief place of a canton, in the district of Murat; 7 leagues S. of Toulouse. The place contains 1827, and the canton 8776 inhabitants; the territory comprehends 20,674 square leagues, and 13 communes.

CARBU, a town of Italy, in the state of Genoa, seven miles W.S.W. of Pisa.

CARBULA, or Carbule, in Ancient Geography, a town of Spain, in the department of Cordoba, according to Pliny.

CARBUNCLE, in heraldry, a charge, or bearing, consisting of eight red, or lances; four of which make a common cross, and the other four a fatter. Some call these radii buttons, or flores; because round, and enriched with buttons, or pecked, like pilgrims' flowers; and frequently tipped, or terminated with fleurs-de-lys. Others blazon them, royal fleurs placed, in fatter, pale and fesse.

CARBUNCLE, in Mineralogy. See SPINELLE.

CARBUNCLE, Carbunculus, also denotes a sort of sandy matter found in Helvola, formed of a hard earth of the same name, composed in the viscosa of the mountains, by the heat of the subterranean vapours.

Pliny and Varro speak of the carbunculus, as a peculiar kind of hot, dry, iron foil.

CARBUNCULI, in Surgery, a roundish, hard, livid, and painful tumour, quickly tending to mortification, and (when it is malignant) connected with extreme debility of the constitution. See Anthrax. When this complaint is symptomatic of the plague, a pellaginous bubo usually attends it. See Plague. The carbuncle is heated deeply, in parts provided with cellular membrane; and therefore does not form discover all its dimensions, nor the ill digested matter it contains. As this tumour is commonly a symptom of depraved health, our chief attention should be directed to the re-establishment of the patient's strength, rather than to the local treatment of the carbuncle. See the directions given under the article Gangrene, which will generally apply to the case in question.

Bleeding, purging, and other antiphlogistic means can very seldom be admissible in the treatment of carbuncles; but, on the contrary, we should support the patient's strength by powerful tonics, fermented liquors, concert air, and anti-purulent vegetables; while the tumour itself may be poulsee, and fomented with anodyne decoctions, till it be fit to be opened by the lancet.

CARBUNCULATION, the blinding, or scorching of the new-sprouted buds of trees, or plants, either by excessive heat, or excessive cold. It happens chiefly in the spring and autumnal solstices, when vegetables being covered with dewy vapours, a sudden cold comes on them, which coagulating those vapours, the nutritious juice of the plant is coagulated, and the texture of its fibres destroyed.

CARBUNCULUS, in Ornithology, ecarboule, and carbunele humming-bird. See TROCHEUS CARBUNCULUS.

CARBURET, in Chemistry, is a combination of charcoal with any other substance. Thus, carburetted hydrogen is hydrogen holding carbon in solution. The only other carbures hitherto certainly known are, carburetted sulphur, carburetted iron, and carburetted copper.
CAR

CARCARIOLA, in Geography, a town of Naples, in the province of Abiruzo Cita; 22 miles W. of Aquila.

CARCASE, the corpse, or body of a dead animal. The carcase of a fowl, capon, partridge, lea, rabbit, &c. is what remains thereof, after the four members, or limbs, viz. the legs and wings, have been cut off.

CARCASE, in Architecture, is the shell or ribs of a house; containing the partitions, floors, rafters, &c. made by the carpenter, &c. The carcase is otherwise called the framing.

CARCASO, in Ancient Geography, now Carcassone, a town of Galia Narbonensiæ, belonging to the Vacet Tectofagi, according to Ptolemy. Cæsar, in the third book of his "Bell. Gall." says, that this town furnished him with troops at the time of his war in Gaul.

CARCASS, in French Carcasse, in Hor. is sometimes a hollow case formed of ribs of iron, and covered over with tallow, &c. about the size of a shell; and sometimes is entirely of iron, like a shell with two, three, or four holes in it for the fire to blaze through. Carcasses are filled with various matters and combustibles for the purpose of setting fire to houses when thrown out of mortars. They were formerly of an oval form, made of iron bars, and filled with a composition of melted powder, saltpetre, sulphur, broken glass, horn flints, pitch, turpentine, tallow, and linseed oil, covered with a pitched cloth. They were primed with unrolled powder and quick match. The flights, however, of the oblong ones were too erroneous and uncertain, that they have been totally laid aside; and none but the round ones are used at present. The following is nearly the manner of preparing them.

Boil 12 or 15 lb. of pitch in a glazed earthen pot, or vessel; mix with that 3 lb. of tallow, 30 lb. of powder, 6 lb. of saltpetre, and as many flint-dusts as can be put in. Fill the carcases before the composition is cold, to do which, smear your hands with oil, or tallow, and fill the carcases one third full with the said composition. Then put in loaded pieces of musquet or piloth barrels, or loaded grenades, filling up the intervals between these with part of this composition, and cover the whole with coarse cloth well sewed together, keeping it as nearly as possible in a round or globular figure. Then put it into the carcases, having a hollow top and bottom with bars running between them to hold them together, and composed of four slips of iron joined at top, and fixed at the bottom at equal distances to a piece of iron, which together with the hoops, when filled, form a complete globular body. When it is quite finished, and cold, it must be steeped in melted pitch, and then infallibly immersed in cold water. Lastly, bore three or four holes at top, and fill them with fuse-composition, covering them with pitch until the carcases is going to be used. Carcasses are thrown out of mortars, and weigh from 30 to 350 lb. according to the mortars employed for throwing them. A carcase for the sea-service differs from a common shell of the same size only in the composition it is filled with, and the four holes in it, from or through which it burns or blazes when fired.

The following is a Table of experiments that were made with round case carcasses at an elevation of 45°.

<table>
<thead>
<tr>
<th>No.</th>
<th>Nature of morter</th>
<th>Weight of the carcase</th>
<th>Quantity of powder</th>
<th>Time of flight in feet</th>
<th>Time of burning in minutes</th>
<th>Length of Range</th>
<th>Remarks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>lb.  oz. lb.  oz.</td>
<td>lb.  oz. lb.  oz.  sec.</td>
<td>min.  sec.</td>
<td>inches.</td>
<td>feet.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>130  8  6  3  0</td>
<td>2 70  173</td>
<td>882</td>
<td></td>
<td></td>
<td></td>
<td>Burnt well in general. Fired from 7 to 9 o'clock in the morning. There was a good light.</td>
</tr>
<tr>
<td>64</td>
<td>120  12  8  3  12</td>
<td>2 70  185</td>
<td>843</td>
<td></td>
<td></td>
<td></td>
<td>Fired from 2 to 4 o'clock in the morning. It was very dark. Gave a very good light.</td>
</tr>
<tr>
<td>70</td>
<td>0  10  10  3  40</td>
<td>2 70  153</td>
<td>962</td>
<td></td>
<td></td>
<td></td>
<td>Fired from 9 o'clock at night to 2 in the morning. Had a very good effect.</td>
</tr>
<tr>
<td>71</td>
<td>121  4  11  3  18  15  5  12  3  40  2 70  1668</td>
<td>34 41</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>0  12  13  4  18  185</td>
<td>4 45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>102  6  14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>70  6  3  4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>120  10  8  3  20  2 70  134</td>
<td>4 45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>60  14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>14  14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>12  14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following is a Table of experiments made with thirteen inch round iron carcasses fired from a thirteen inch sea-service mortar at Woolwich in 1773.

<table>
<thead>
<tr>
<th>Empty</th>
<th>Full</th>
<th>Powder</th>
<th>Elevation</th>
<th>Range</th>
<th>Remarks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb.  oz.</td>
<td>lb.  oz.</td>
<td>lb.  oz.</td>
<td>deg. min.</td>
<td>feet.</td>
<td>One small piece burst from the carcase and fell at the distance of 4500 feet; the other piece contained the composition. The two last did not break.</td>
</tr>
<tr>
<td>1 2 7</td>
<td>1 3 12 30 0 14 0</td>
<td>1 0 870</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 3 1</td>
<td>3 14 30 0 14 0</td>
<td>1 0 9000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 3 3</td>
<td>3 6 30 0 14 0</td>
<td>1 0 10200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1 4</td>
<td>1 3 17 30 0 14 0</td>
<td>1 0 10500</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CARCASE,
C A R

Carcas, is said, were first made use of by the bishop of Montre at the siege of Groll, in 1672, where the duke of Luxemburg commanded.

Carcas, in Geography, a town of Spain in Va- lenzia, seated in the valley of Xinar.

Carcassonne, an ancient town in France, and principal place of a district in the department of the Aude, formerly the capital of a county called Carcassonne, and before the revolution the residence of a governor, and the seat of a bishop, suffragan of Narbonne. It is divided by the river Aude into the upper and lower town, both of which are encompassed by a wall. The former is situated on an eminence, and has a castle which commands the whole town, and an ancient cathedral. The lower town is more considerable, and is regularly built in the form of a large square. Its streets are straight, and intersect one another at right angles, and they lead to a large square in the centre, where is a fountain formed of rock-work, and having on the top of it a statue of Neptune. The quays are ornamented with rows of trees, which form agreeable walks, and the adjacent country, which is mountainous, abounds with olive-trees and vines, and affords a fine marble, called "the marble of Languedoc." Carcassonne suffered very much on occasion of the crusade which was undertaken against the Albigenses in the beginning of the 13th century; and after having been invested by Simon de Montfort, who directed and commanded the military operations of the church, A.D. 1209, was allowed to capitulate on condition that the inhabitants should evacuate it in a state of nudity; nor was Agnes the vicomtesse, though young and beautiful, exempted from this ignominious and shocking punishment.

The place is said to contain 17,149, and the canton 18,516 inhabitants; the territory includes 124½ kilometres and 8 communes. It is 12 leagues W. from Narbonne, 19 S. E. from Toulouse, 15 N. E. from Foix, and 160 S. from Paris. N. lat. 43° 11'. E. long. 39° 25'.

Carcathicert, in Ancient Geography, a town of Asia, in Greater Armenia, near the Tigris, according to Pliny. It was a royal city of the country called "Sophenia," according to Strabo.

Carcatty, in Geography, a town of the island of Ceylon; 35 miles N. W. of Trincomaly.

Carcavee, a town of Ilria; 5 miles S S. W. of Cape Pabia.

Carcavelos, a village of Portugal in the vicinity of Lisbon, between which and the town of Oeiras is produced the sweet wine, called in England Lisbon, in Germany Portugeiswein, and in the country itself wine of Carcavelos. The vineyards are included in quintas, on a gentle declivity towards the sea, and the must is generally sent to Lisbon, where it is made into wine. This wine which is generally white, and of that colour, is drank in the country in great perfection, nor can the adulterated liquor sold in foreign countries under that name be compared to it.

Carcavi, Peter Dee, in Biography, was born at Lyons, and became counsellor to the parliament at Toulouse. He was the friend of Ferrier, who at his death left to him the care of his writings; and after the death of Merfemus he corresponded with Des Cartes, with whom he became acquainted in 1646. At the time of his correspondence, or about 1649, he was settled at Paris, where he became counsellor to the grand council, and keeper of the king's library till the death of M. Colbert. He was also the particular friend of Pascal and Roberval. Interfering with some warmth in the dispute that took place between the last of these mathematicians and Des Cartes, the correspondence between him and Des Cartes was broken off. He was distinguished by his great knowledge of books, antiquities, and medals. On the establishment of the French Academy in 1666, he was appointed geometer. He died at Paris in 1674. See Bage.

Carcere, in Antiquity, were the pits, or hurdle of the circus, within which the horses were confined, till the signal was given by the magistracy for lancing.

The word is Latin, supposed to be formed of a root car, as they were formed of a refrain or round, they were as the horses ready to run in the Olympic games a fretted cord, called "halia" served this purpose. Tancy says, that the Romans divided the halia of the Greeks, A. U. C. 435, and constructed carceres in their room.

The number of carceres was twelve. In the early days of Rome they were made of wood, which Clodius afterwards changed for marble. They were kept fast with bolts, fastened by ropes, which, the moment the signal was given, flew open all at once. Some think that only four were used at a time. See in Claud. cap. xxix. n. 6 See Circus maximus.

Carcha, in Ancient Geography, a town of Asia, in Affryria, seated on the eastern bank of the Tigris, about 50 leagues S. of Niniveh, and 25 N. of Bagdad.

Carchemish, or Carchemis, a town of Asia, in Affryria, seated in the Euphrates and belonging to the Assyrians. Whilst the Assyrians were defending themselves against the Scythians, who had conquered the whole of Upper Asia, Phrazo-Necho, king of Egypt, laid hold of this favourable opportunity for recovering the city, which was then subject to the king of Assyria. The garrison, which he left in it, was cut in pieces by Nebuchadnezzar in the fourth year of Jehoiakim, B. C. 666 (2 Chron. xxxvii. 20. 2 Kings xxiii. 29.). Carchemish is probably the Cerceium, Circeium, or Circeum of profane authors, seated in the angle formed by the junction of the Chaburs and the Euphrates with the Euphrates.

Carcherd, in Geography, a town of Persia, in the province of Chorasan; 44 miles N. W. of Herat.

Carchi, in Ancient Geography, a people of Asia in Media, according to Polybius.

Carcinus, in Geography, a small fertile island in the Mediterranean sea, near that of Rhodes.

Caricus portus, in Ancient Geography, a port of Gallia Viencheul, nearly S. E. of Marseille, and N. W. of Ciboris portus.

Carcina, or Carcines, a navigable river of Italy, in the country of the Bruni, between the promontories Cocentium and Lavinium, according to Pliny.

Carcine, or Carcinitis, the name of a town near W. of the ischus which joins the Crimean to the continent, at the mouth of the small river Calanza.

Carcinitis sinus, a gulf of the Euxine sea, between the Tanric Cheroneusis and Scythia. Strabo calls it Taurinae Abbas and Carcinetes. It was afterwards called Necro-Pyla.

Carcinum, in Opiuinum, in Zoology. See Dasyx.

Carcinoma, in Surgery, the name of a cancer, which was named Carcinoma by the Greeks, from castris, a cancer, and yμνον 1 guaw or corrode; hence comes the word carcinomatosus or cancerous. See Cancer.

Caricinum, in Ancient Geography, a town of Italy in Bruttium, probably the name with "Carchus," placed by Ptolemaeus Melas in the gulf of Squillace.

Carcoma, a port-town of Africa, S. W. of the promontory.
CAR

monitory Atsline. Ptolemy places it immediately after Cardo and Carephia.

CARCOTA, a people of Sarmatia in Europe, who inhabited that part of the country which was in the vicinity of the Carbones, according to Ptolemy.

CARPRAIG, in Geography, a small island of Scotland, in the fifth of Firth; 7 miles S. E. of Dumfries.

CARCUNAH, a town of Africa, in Ethiopian Barbary.

CARCUS, in Ancient Geography, a name given by Ptolemy to an island of the Indian Ocean, which he places near Taprobane.

CARCUETUM, a place of Spain, in Lucitania, according to the Antonian, Itin.

CARD, in the Manufacturers, an instrument consisting of a block of wood, beelt with sharp teeth, for use to arrange the hairs of wool, flax, cotton, and the like: of which there are different kinds, as block-cards, hand-cards, wool-cards, tow-cards, &c.

The word seems formed from the Latin cardus (fulcrum) which denotes the fuller's teazle; a kind of thistle whose head is used to smooth and range the nap of cloth, &c. Skin. Etym. Angl. in loc.

They are made in the following manner. A piece of thick leather, of the size of the proposed card, is stained in a frame, and then pricked full of holes, into which are inserted the teeth or pieces of iron wire. The leather is then raised by the edges of a flat piece of wood, in the form of an oblong square, about a foot long and half a foot broad, with a handle placed in the middle of one of the longer sides. The method of making the teeth is as follows: when the wire is drawn of the intended size, a number of wires is cut into proper lengths by means of a gage, and then double in a tool contrived for that purpose; after which they are bent into a proper direction by means of another tool, and then are fixed in the leather. See Carding, Cloth, and Cotton Manufacture.

Cards for wool in England, may not be imported, nor the wire taken out of old cards, to be put into new leather and boards, in order for sale; upon forfeiture thereof, or of the value, if not seized; but may be amended for the proprietor's own use, or for transportation only.

Card-playing. See Cards.

CARDALIENA, in Ancient Geography, a country of Arabia Felix. Pliny.

CARDAMENE, or Cardamina, an island of the Arabian gulf on the coast of Ethiopia. It was reparted by the island of the Magi from the Trogodic territory, according to Ptolemy and Pliny.

CARDAMILIA, in Geography, a town of European Turkey, in the Morea; 14 miles S. W. of Militra.

CARDAMINDUM, in Botany, Few. peruv. 3. tab. 8. and 2. tab. 42. See Tropeolum majus and pneorum.


Gen. Ch. Cal. Perianth four-leaved; leaves oblong-egg-shaped, obtuse, somewhat spreading, gibbosus, small, deciduous. Car. four-petalled, cruciform; petals inverely egg-shaped, oblong, wide-spreading, ending in erect claws, which are twice the length of the calyx. Stam. Filaments six, awl-shaped; of these, two opposite ones are twice the length of the calyx, the rest a little longer; anthem small, heart-shaped, oblong, erect. Fil. Germ slender, cylindrical, the length of the flamen: style none; stigma obliquely headed, entire. Peric. Silique long, the shape of a compressed cylinder, two-celled, two-valved; valves opening from the base with a spring, and rolling spirally backwards. Seeds many, roundish.


Obf. There is a variety of one species, in which the two shorter flanges are wanting. Leaves simple.

Sp. 1. C. bellidiformis, daily-leaved or alpine cress. Linn. Sp. Flora Lapp. Ed. 2. 1222. tab. 9. fig. 2. Flor. dan. tab. 20. Jacq. Misc. v. 1. 148 tab. 17. fig. 29. "Leaves egg-shaped, quite entire, only a third of the length of the petiole." Root perennial, small, fromobout. Stems very few, two inches high, erect, simple, few-flowered, smooth. Leaves egg-shaped, smooth; radical ones on long peduncles; stem ones nearly sessile. Flowers in a terminal corolla; petals white, erect, twice as long as the calyx. Silique linear, obtuse, smooth. Dr. Smith, Flora Brit. vol. ii. p. 697. Much obscurity hangs over this species. Ray's C. pumila, bellisfolium, generally quoted as a synonym, Dr. Smith says, certainly does not belong to it, and is probably arabis frineta. The only real authority for its being a native of Great Britain is Dr. Wahtering, who had specimens gathered wild in Scotland by Mr. Milne. All that he says of it is, that the root leaves are on long peduncles, and that in its larger growth there are leaves on the stem, but rarely with petals. Willdenow describes two plants, nearly allied to each other, but, as he supposes, different species. One with the flowering stem not longer than the root-leaves, and either naked or with one or two leaves on long peduncles; the other with the flower stem longer than the root-leaves, and with leaf-leaves nearly sessile. The former, a native of Lapland and Norway, he calls bellidifolia; the latter, a native of the Alps, he calls alpina. La Marck makes it an arabis, but it does not seem to be the arabis bellidiformis already described in this work. 2. C. ararifolius, araribaccus-leaved cress, Linn. Sp. Pl. (Naffurtum montanum, ararifolius; Bocc. Sic. 5. tab. 3. Herr. Par. tab. 203. Rai hist. 816. Naffurtum alpimum, paludare rotundifolium, radice rectae; Moris. hist. 2. p. 234.) "Leaves simple, somewhat heart-shaped." Root perennial, thick, sending out numerous fibres. Stems about six inches high. Leaves petioled, a little falcate, smooth. Flowers white. Silique long, burfting at the leaf touch when ripe. It poizes the qualities of ferny-gras in a greater degree than the other species of cardamine, and is often substituted for it. A native of Savoy, Tufane, &c. 3. C. nudicatius, naked-stemmed cress, Linn. Sp. Pl. Gmel. Siber. 3. p. 471. n. 43. "Leaves simple, lanceolate, scoliae-toothed; stems naked." Stems about nine inches high. Leaves about three inches long, smooth, firm. Siliques tender, diatrated, smooth, compressed between the feeds. A native of Siberia. 4. C. rivulalis, Willd. Pallas. itin. 2. App. 4. 113. t. u. Germ. tom. 3. Pl. 17. p. 264. French. Transl. "Stem and root-leaves simple, oblong, toothed. Whole plant smooth. Root perennial. Root leaves leaffed at the base into a petiole; stem-leaves sessile. Flowers small, white. Siliques reflexed. 5. C. petrea, Linn. Sp. Pl. "Leaves simple, oblong, toothed." This species is omitted by La Marck and Willdenow. Willdenow says it is a dubious plant, all the synonyms certainly belonging to arabis frineta. This, with respect to the Welsh and Scotch supposed synomyns, is confirmed by Dr. Smith. But on his authority we have retained the species; for he speaks of the true Swedith C. petrea of Linnaeus in terms implying a satisfactory
satisfactory acquaintance with the plant, which we presume is preserved in the Linnean herbarium. See English Botany, p. 469. The C. petrosa of Lightfoot is there described, and figured as a new species under the name of C. hoffiulata. But before the publication of the Flora Botanica, Dr. Smith was convinced that it is properly an arabis, and nothing more than a variety of arabis bipida, and of the Welsh plant mentioned above. A. petrosa, by Dillenius, Hudson, and Withering. As such it appears in the latter work. We now perceive that in the article arabis, we have been led into an error by following Professor Martyn, who thought the stricta of Hudson, and the bipida of Linnaeus, to be the same plant.

**Leaves terminal.**


**Leaves wharged.**

10. C. chelidonia, Linn. Sp. Pl. Pallas it. 3. 34. Linn. Coch. 398. (C. glabra, chelidoni folio; Tourn. Inst. 224. Sibthrum montanum latifolium: flore purpureo, Bar. it. 156. Nallurtium Pyreneorum, Herm. par. tab. 204.) "Leaves winged; leaflets in five, gathered." Root perennial. Stem about nine inches high, nearly smooth, with many ascending branches. Leaflets, especially the terminal one, remarkably large, roughened, with short hairs. Flowers large, purplish white, in terminal corymbs, lengthening into spikes; petals obtuse or slightly emarginate, twice the length of the calyx. A native of the Pyrenees, Italy, and Siberia. 11. C. helvola, Willd. La Marec. Allon ped. tab. 57. fig. 1. (C. Plumieri; Vri. delph. 3. tab. 38. Nallurtium thalictroid folia; Benth. Muf. 171. tab. 106.) "Leaves simple, ternate and winged; leaflets in five, obtuse, toothed, three-lobed." Root biennial. Stems about four inches high, slender. Root-leaves often ternate, on rather long petioles, terminal leaflet large, three-lobed; lateral ones irregularly egg-shaped; upper stem-leaves in five. Flowers white, twice as long as the calyx. Siliques an inch long, slender, a little compressed, with eight or ten reddish seeds. A native of Piedmont and Dauphiny. 12. C. macrophylla, Willd. (C. chelidonia, Pal. it. 3. p. 34. Lic-
petioled, remote; leaves oblong, unequal at their margin, with one or two teeth. *Flowers* in a corolla, numerous; pedicels an inch long; leaves of the calyx oblong, with a membranous edge; petals three times the length of the calyx, purple, slightly emarginate. Val. A native of Spain. 19. C. pratensis. Ladies-smock, cuckoo-flower, milkmaid. Linn. Sp. Pl. Curt. Flor. Lond. falc. 3, tab. 40. Mart. Flor. inful. tab. 42. Mart. Flor. inful. tab. 75. Woodii Med. tab. 39. Eng. Bot. 775. Flor. Dun. tab. 1390. "Leaves winged: radical leaves roundish, thiofe on the stem lanceolate." Root perennial. frequently toothed in some degree like that of coral-wort. Stem about a foot high, erect, stiff, simple. Leaves winged: root ones on long petioles, somewhat lycraphed; leaves somewhat hairy; stem ones sessile, alternate; leaves smooth, channelled, generally entire. *Flowers* large, purplish or white, in a head-like terminal corolla, becoming double by cultivation. The colour and appearance of the flowers, the flower more elongated than in any other species of Cardamine, and above all the tendency of the leaves in wet shady places to bear bulbs, give the same affinity to the genus Dentaria or coral-wort. It has the same febile qualities as the Syphyrium nairtium or water erica, but in a very inferior degree. The flowers have obtained a place in the British Pharmacopoeia on the authority of Sir George Baker, who recommended them to be taken internally in epipodiform disorders: they have even been said to cure the epilepsy, but experience has not confirmed their reputation. They were prescribed dried, which Dr. Smith observes, is not an advantageous state for plants of this natural order. See Dr. Smith in English botany, and Woodville's Medical botanist. A native of wet meadows in many parts of Europe. 20. C. amara, bitter cress. Linn. Sp. Pl. Curt. Flor. Lond. falc. 3, tab. 39. Eng. Bot. 1022. "Leaves winged: root leaflets roundish, stem ones angularly toothed. Stem taking root at the base. Antlers violet-coloured." Root perennial, toothed. Stems procumbent at the base, and taking root in the mud, then upright, a foot high or more, somewhat zig-zag. Leaves nearly smooth. *Flowers* large, white or cream-coloured; style a little elongated and oblique. Found on the banks of the Thames about London, of the Aire, Eure, and other rivers in Yorkshire, Kingstrected meadows near Newick, and in Scotland. 21. C. granulaa, Willd. Allion, pedem. (Nauturium pratense oloratum radice granulata tuberosa; Bsh. pin. 164.) "Root-leaves simple, roundish, on long petioles; stem leaves winged; leaflets lanceolate; root granulated." Root perennial. Stem near half a foot high, erect, stiff. Root-leaves entire, decurrent into the petiole: stem-leaflets obtuse, entire. *Flowers* white; petals obtuse, not emarginated, three times as long as the calyx. A native of meadows near Turin. 22. C. virgineia, Linn. Sp. Pl. (Alyum, Gron. virg. p. 170. Nauturium buria tosorios frutico; Pflim. Alm. 251. tab. 101. fig. 4.) "Leaves winged; leaflets lanceolate, one-toothed at the base." Root-leaves spread into a circle; leaflets numerous, almost imbricated; stem-leaves few, often linear, entire. La Marek thinks it a true Arabis. A native of Virginia. 23. C. farinosa, Forth. Flor. auct. p. 520. Found by Forster in the island of Teneria in the South Seas. The varieties of pratensis and amara with double flowers may be readily propagated by parting the roots. They thrive well in shady situations.

**Cardamine alpina 3-minima:** Cluf. hift. See Lepidium alpinum.

**Cardamine pulfola sativallis montana defsecoides;** Col. ecpl. tab. 273. See Lepidium petraenum.

**Cardamine solonifera; Scop. Flor. Carn. and Matthbn Miller. See Aruris Halleri.**

**CARDAMOM:** for the botanical characters, see Amomum cardamomum and refert.

The Cardamoms imported into Europe have been commonly distinguished by the epithets, Majus, Medium, and Minor; but the species from which the two former are produced have been in imperfectly delimited, and their botanical history is so confused, that nothing decisive can be said concerning them. One of the three is probably the Cardamomum of Linnaeus. The seeds of the *Minor*, which are now generally preferred for medical purposes, are said by Somner to be the produce of his A. repens, discovered by him on a mountain on the coast of Malabar, where it grows so plentifully as to supply all India with its feeds, and which on that account is called the mountain of Cardamoms. It is figured in Woodward's medical botany. They are brought to Europe in their natural bank or pad, without which they would lose a part of their flavour, and this is divided internally into three cells, in each of which are contained two rows of triangular seeds, brownish on the outside and white within. These seeds have an extremely grateful aromatic smell, and when chewed, they impart a glowing warmth, and grateful pungency to the mouth. Their virtue is extracted both by alcohol and by water; the former giving a clear, the latter a turbid solution, both yellowish. The watery infusion is highly mucilaginous. When these feeds, previously bruised, are diffused with water, a small quantity of essiential oil, about one thirtieth of the weight of the feeds, on an average, may be separated, and in this seem to reside all the aromatic qualities. It is of a pale yellow, very acid, and strongly smelling of the cardamom. The watery solution infusified yields a gummy-reflux extract; the spirituous solution gives a resinous extract much less in quantity. Neither of them are used.

Cardamom is one of the most grateful of the mild aromatic, and is used either to flavour other medicines, or as a stimulant and cordial. It agrees in general particularly well with dyspeptic flomas, and prevents the gripping or nauseating effects of many of the falous or other purgatives. A tincture is made of it both simple and compounded with caraway, cinnamon, and cochino. Cardamom also enters the composition of some other aromatic preparations.

The feeds of the Cardamomum Majus, denominated also *Grama Paradisi or Margaritae, Greater Cardamom Seeds*, we hard reddish-brown angular seeds, much larger than the last mentioned, about the size of radish seeds, generally imported without the husk, from the East Indies. The smell and flavour of these are much more aromatic and grateful than those of the lesser feeds, and the tincture is hot, biting, and somewhat coarse. It yields an essiential oil not very acid, but the watery and spirituous solutions are both highly pungent. These feeds are but little used. See Lewis's "Materia Medica," and Woodville's Medical botany.

**CARDAMUM, in Geography, an iland situate in the pallagiæ from Malacca to the fracts of Singapore, or South end of Malacca fratts.**

**CARDAMYLA, in Ancient Geography, a town of Mele-"nia, almost south of Geremia. It was one of the seven cities which Agarmonon wished to present to Ambrosia. Paulus"nias speaks highly of the temple of Minerva and a statue of Apollo "Carus," the worship of whom was common to all the Dorian. This town was detached by Augustus from Meleposia, but afterwards restored to its original masters, the Lacedemonians.

**CARON, in Geography, a voluminous philo-"phical and medical writer, was born at Pavia Sept. 24th, 1501. His father, who was an eminent civilan, and a diffin-"
guided scholar at Milan, took the charge of his education, in the early part of his life, and he particularly instructed him in mathematics, astronomy, and judicial astrology. He is said not to have been born in wedlock, and in the account he gives of his own life he says, his mother, when pregnant with him, endeavoured to destroy him, by poisoning abortion. She was a woman of strong passions, and he probably derived from her that curiosity of disposition, and violence of temper, which prevented his seizing the advantages he might have obtained from his genius and learning. At the age of 20 he entered the University of Pavia, where he professed his medical and philosophical studies with success; he then went to Padua, in 1524, and in 1526 he took the degree of doctor in medicine. In 1528 he repaired to Milan, but was some time before he acquired any credit in his profession; he was therefore reduced to great difficulties. His first appointment was that of professor of mathematics, for which he was peculiarly qualified, and a few years after, viz. in 1530, he was admitted a member of the medical college in that city. This brought him into notice; but that he was not at peace with his brethren, appears by his two chief publications, "De malo recentiorum Medicinarum medendi usu," Vent. 1536; and "Contradictorium Medicum Liber duo," Lyons, 1548: in the first he severely confutes the practice of his contemporaries; in the other the inconsistent and often contradictory accounts of the same disease, given by the most accredited writers, even among the ancients. In 1547 the king of Denmark, on the recommendation of Velsalus, invited him to accept the office of a professor in the university of Copenhagen, with a handsome salary; the offer was, however, refused, his time, we may presume, being now more advantageously employed in practice. The reputation he had acquired in this way occasioned his being sent for to Scotland, about this time, to attend Hamilton, archbishop of St. Andrews, and brother to the regent, who was afflicted with asthma, for which he had before tried the affinities of the physicians to the king of France, and the emperor, but without receiving any benefit. Cardan was more successful, for by the end of about two or three months the archbishop was so much relieved, as to allow him to return to his own country, having received a large remuneration for his services, and liberal offers to retain him in Scotland. On his return he passed through London, and is said to have called the nativity of our king, Edward VI.; but we do not learn that he forbore the short date of that monarch's existence. At Milan he continued to reside until 1559, his time being employed in the practice of medicine, and in teaching mathematics; from 1559 to 1562 he resided at Pavia, being invited to accept the chair of professor in medicine there; and from 1562 to 1570, at Bologna, where he fixed a similar office. He was now, for what cause we are not informed, thrown into prison, but as he was soon liberated, we may suppose for no very serious offence; for though haughty and turbulent, he seems generally to have acted with sufficient caution, as in whatever country he resided, he was never seriously embroiled with the church or state. It appears, also, that he had the faculty of attracting the notice, and procuring the friendship of those persons who, by their wealth or power, were most able to support him, but by the waywardness of his disposition he soon lost their favour; hence he was always in a state of indigence, which he relieved by sending to the presses some halffly effusions, which had no more of his care than it cost him to write them over. His works, therefore, which were collected after his death, and which fill ten massive folio volumes, consist of such confused and undigested medleys, that it would require more labour to put them in order than their intrinsic value would compensate. Soon after being released from prison, he was sent for to Rome, was made member of the college of physicians there, and delivered a panegyric by the pope, which he attributed to the time of his death, Sept. 21, 1576: It has been said, that he flavoured himself, in order to verify his own prediction of the time of his death; but this is improbable, because he had long before acknowledged the failure of a similar prediction. The same, however, relates (lib. 6. p. 155.), that this fact was believed. Scaliger ascertained it, and it is said that his father died in the same manner, in 1531. On him it is also said, that his eyes were white; and that he saw in the night time, and could see without spectacles. Cardan, De Vita propria, p. 10. His unquenchable thirst, we believe, was an affection derived to acquire and communicate knowledge. Though a large portion of his life was passed in a state of indigence, yet it did not appear to depress his spirits. He considered knowledge, of which he could not but be conscious he held a large share, as nobly preferable to wealth. That he had no mean opinion of his own talents, or of his value to the community, seems evident by the following, supposed to have been written by himself, and intended as his epitaph:—

"Non me terra teget, celo sed rapit in alto, Iliifiris vivam, dexta per ora vivam."

Quidquid venturus spectabit Thesaurus in annis, Cardanus nolet, nomen et uile fruitum."

Vanity seems to have been with Cardan a predominant passion; for though with apparent frankness he relates the various adventures of his life, which shew the inconstancy of his temper, he nevertheless conceals or palliates others, which were more dishonorable. Addicted to youth to judicial astrology, he pretends to deduce, by means of his skill in this science, the invariable influence of celestial bodies, an apology for the licentiousness of his opinions, and the eccentricities of his conduct. Such was his confidence in the conclusions furnished by this art, that in his treatise entitled "Epistolicus Censorius," or a calculation of nativity, he hazards many predictions concerning his own character and fortune, as well as others that related to Jesus Christ. Whilst he acknowledges a propensity to irreligion, and advances some sentiments that subject him to the fulpicion, if not to the direct charge, of atheism, he justly incurrcs the reproach of credulity and superlition. Having been accustomed, in consequence of his father's instruction, at eight in the morning on every first of April to repeat a prayer and an Ave, he conceived that he was thus secured of obtaining any favour he should ask. From numerous prodigies that occurred, both sleeping and waking, he pretended to infer what should befal him; and he sometimes seems to intimate, that, like Socrates, he was attended by a particular genius. Whilst he boasts of certain supernatural gifts that were conferred upon him, he must either be conscious of wildtul falseness, or labour under a fanatical derangement of the understanding. Indeed, many have imputed that the preponderance of his imagination over his judgment did actually produce a species of insanity. At the same time he affected singularities of dress and of behaviour, which seemed to indicate a degree of studied artifice and imposture. Under the influence of strong passions, he was frequently betrayed, notwithstanding his distinguished abilities and erudition, into errors of judgment and irregularities of conduct, which tarnished the lustre of his other laudable qualities, depreciated his character, and provoked occasion of perplexity and unhappiness to himself. These errors and irregularities aggravated, in so small degree, his domestic diftrusts. One of his sons married a woman, deftirute both of fortune and reputation, and determined to get rid of her by poison; he was convicted, condemned, and executed. Cardan attempted to justify this atrocious crime,
on the ground of the wife’s infidelity; and pretends that the

on the ground of the wife’s infidelity; and pretends that the
divine vengeance pursued the judges of his son for their sen-
tence against him. Another son behaved so ill, that he was

obliged to impiomine, and at length to defeard and disinherit him.

In his medical profeflii, Cardan was a ingenious observer,

and an admirable collector of facts; but he was at the same
time too bold to be called delusional, as to claim little or no con-
duced. He wrote on every branch of medicine; but the

volumes in which he treats of natural history, which give

accounts of extraordinary cures, or descriptions of unusual

or prenaturial productions, have been received with the
greatest favour, and have been the most frequently reprint-

ed. His accounts, however, under these heads, must not be

alas implicitly admitted; the greater part of these will be

found in his treatise “De Varitate Rerum,” fol. Baf.

1552, and again 1557. In his “Commentaries on the

Aphorisms of Hippocrates,” 1551, 4to. Padov. he records a
case of a wound in the pericardium, in which the patient

recovered, and of a person who lost a portion of the brain,
equal in fize to a hen’s egg. The man lived three years
after the accident, but in a state of faticity. In his “Dao

mattica,” Stratl. 1789, fol. he describes the difeases inci-
cident to cattle, with the manner of treating them. The 6th

book of his treatise “De Substitution,” published 1559, is
entirely botanical, and contains descriptions of numerous

plants, then firt introduced into Italy. In his “De Chirurg.
cet Sarfaparillo Radichios,” Sec. 1556, he describes the
manner of preparing the decoction of thofe roots, and of
adminiftrating them. In his “Opuscula Artern Medicam

exercitabunt utilissima,” are fome curious obfervations on
the external application of cold water, which he had

witnessed in Scotland; and external prafises of the internal
ufe of the pure element in fivers and other difeases. His

“Ars curandi parva, qua eft abhirhifima medendi Metho-
dius,” Basl. 1662, 2 vols. gives his general method of cure
in difeases, with many particular obfervations. His “Opus

novum de Sanitate trienda ac Vita producenda,” a pohif-

eous work, published in 1580, fol. contains a copious enu-

mation of articles of diet, and of direotions for the mode of
living, blended with much idle and superflitious matter.

For an account of his other medical works, &c. see Hailer
Bib. Med. pract. chirurg. anat. et botan. or Eloy’s Dict.
Hiftor. The cures which he undertook to perform by fe-
cret charms, or by the affifiance of invisible spirits, gained
for him with the vulgar, the reputation of a magician; but
in reality they were only evidences of a mind infatuated by
superftition.

In mathematical science Cardan claims a tribute of more

unrestricted commendation. In algebra particularly he

challenges the honour of having made some important difco-

very; though his pretentions, as an original inventor, have

been controverted by Tartaglia. These discoveries are contain-

ed in the 16th book of his Arithmetical writings, which was
published at Milan in the year 1545. Seel Algebra. In
order to jufify Tartaglia’s prior claim, it has been alleged,
that in a trial of skill with Antonio Maria del Fiore or
Florida, he had discovered the general theory of equations of
the third degree. The occasion of it was this: Florida
had received from his master Scipion Ferree, about 30
years before, a general rule for resolving a particular cale of
of cubic equations, expressed by \(x^3 + bx = c\). Prefuming
on this discovery, Florida provoked Tartaglia into a content,
in which each should propose to the other 30 questions; and

he who first resolved them within a limited time, was to
win the proposed wager. Tartaglia, eight days before the flipu-
tated time, discovered not only the mode of resolving the
cafe of Florida, viz. \(x^3 + bx = c\), but also the cafe \(x^3 =

b x + c\). On the day of meeting, Tartaglia resolved all his
adversary’s questions in the space of two hours, without re-
ceiving one anfwer from Florida in return. Accordingly,
the wager was decided in favour of Tartaglia, and he most gen-

erously remitted the forfeit incurred by Florida. Cardan, who
was preparing a large work in arithmetic, algebra, and

gometry, having heard of Tartaglia’s discoveries in cubic equa-
tions, was very anxious for obtaining his rules of solution,
that he might infert them in his propofed work. After
several urgent invitations, he at length prevailed on Tartag-
la to pay him a visit at Milan in the year 1539; and in a
conference, induced this mathematician to furnish him with
his rule, which he did in 27 rude Italian verbs: but he

firt exacted from Cardan a promise on oath that he would
not publish what he discofeced to him. Some difficulty af-

terwards occurring in the explanation of these verbs, and in
the ufe of the rule conveyed by them, Cardan obtained from
Tartaglia the solution he required. For some time Cardan
kept his promise, though not without fome fupofitions on
the part of Tartaglia, with regard to his integrity. At
length, however, when in 1543 he published his work en-
titled “Ars magna,” he inferted in it the solution of Tar-
taglia, attributing it to the inventor. Tartaglia complained
of Cardan’s violation of faith; and he jufifed himself by
faying, that the additions which he had made to Tartaglia’s
method of solution, gave him a right to publish it. To
this purpofe Montuclaf obferves, that Cardan had in fect
the merit of partly extending, and much illuftrating the the-
fory of Tartaglia. The difpute between them was long and
acrimonious, and terminated only with the life of Tar-
taglia in 1557. The rules which occlafioned this conflfet, have,
howevers, retained the name of Cardan: although it would
be more equitable to give them the title of the formula of
Tartaglia, since they were originally his. For a further
account of this controversy, and of the letters that paffed
between the difputants, we refer to Montuclaf’s Hift. Ma-
them. tom. i. p. 591. &c. and Hutton’s Math. Dict. art.
Algebra.

The philosophical notions of Cardan, both as they repre-

sent matter and mind, are principally detailed in his works “De
Substitutio,” and “De Varitate Rerum;” but they are so

blended with fancifical visions, and the moft extravagant

delirious effusions of myfical folly, and fo ill digested and
arranged, that they cannot be easily explained or un-

derftood. They form a kind of confused medley, delinis-
guished more by an affection of novelty and irregularity, and by
the inane of an unbridled imagination, than by a found
and difcriminating judgment; and for want of methodical
arrangement, they contribute little to the promotion of im-
portant and ufeful fience. They are, however, occasionally
intermixed with experiments and obfervations on natural
phenomena; and they are chiefly ufeful as by the freedom
and boldnefs with which the author divulged them, they
serve to emanipate the human mind from the fetters of an-
cient authority. Upon the whole, Cardan, notwithstanding
the variety and apparent originality of his writings, must be
ranked among the unsuccessful adventurers in phi-

losophy. Of his peculiar dogmas, the following may serve
as a fpecimen. “Primary matter, which remains immu-
nately the fame, fills every place, whence, without the anni-
hilation of matter, there can be no vacuum. Three prin-
ciples fubfift every where; matter, form, and mind. There
are in matter three kinds of motion; the firt, from form
to element; the second, the reverse of this; the third, the
deficient of heavy bodies. The elements, or prafive prin-
ciples are three; water, earth, and air; for naturally all
things are cold, that is, deftitute of heat. The agent in

nature
nature is celestial heat: the air, being exposed to the action of the solar rays, is perpetually in motion. The moon, and all the other heavenly bodies, are luminous from themselves. The planets are animated by an ever active principle, and are therefore never quiescent. Man, having mind as well as soul, is not an animal. The dispositions of men are produced, and all moral affairs are directed by the influence of the stars.

The mind is universally diffused, and though it appears multiplied, is but one: it is extrinsically, and for a time, attached to human bodies, but never perdurable.

In his book above-mentioned, "De Subtilitate," Cardan compares the dogmas of various religions, and the arguments for them, and it is said, puts the weather in the mouth of the Christian. The works of Cardan, treating of metaphysics, logic, natural philosophy, medicine, mathematics, and morals, were collected by Spun, and published in ten volumes folio, Lond. 1667. Of his numerous and multitudinous publications, one reason is assigned from his own confession, that his poverty induced him to fill up his fleets, with which he supplied his book-seller at a fixed price, with any thing that occurred to him.


CARDANO, in Geography, a town of Italy, in the duchy of Milan, seated on the Arno.

CARDASS, a fort of card, proper for carding fleeces of silk, to make c.appspote of it. It also is the name which the French give to those fleeces of silk.

CARDASSES is also the name which, in the cloth manufactories of Languedoc, they give to a fort of large card, which is used for carding the dyed wool, designed for making cloth of mixed colours.

CARDAVA, in Ancient Geography, a town placed by Pliny in the interior of Arabia.

CARDEN, in Geography, a town of Germany, in the circle of the Lower Rhine, and electorate of Treves, seated on the Mofelle; 77 miles N.E. of Treves.

CARDENNOSSA, a town of Spain, in Old Castile; 4 leagues from Avila.

CARDERS, in the Woollen Manufactury, are persons who prepare wool, &c. for spinning, &c. See Carding and Cloth.

Carders, spinners, weavers, fullers, fitters, and dyers, not performing their duty in their occupations, shall yield to the party grieved, double damages; to be committed until payment. One justice to hear and determine complaints.

Carders, combers, fitters, spinners, or weavers, conveying away, embalming, or detaining any wool or yarn, delivered by the clothor, or any other person, shall give the party grieved such satisfaction as two justices, mayor, &c., shall think fit; if not able or willing to make satisfaction, for the first offence to be whipped, or in the flock in some market-town, or in any other town where the offence is committed: the second offence to incur the like, or such further punishment, by whipping, &c. as justices shall think proper. Conviction by one witness on oath, or confession.

CARDI, Ludovico, called Gigioli and Gisols, in Biography, an eminent historical painter, a scholar of Santi di Titi, gave a new style to the Florentine school, and, though he did not approach nearer to the style of Correggio than any of his contemporaries, as Baldini excrestructs himself, he ac-

quired very considerable eminence in his art. He executed himself with freedom and Correggio's elegance, bound to it solid in design which he acquired from the antique masters, and from the works of Michael Angelo, Buonarroti, and other masters in correct drawings, and fit it off by judicious perspectival, and a much more lively colour than that of the Tufcan school; nevertheless, his pictures do not exhibit that contrail of tints, that impatience, that splendour, that grace of airy, that bold fore-shortenings, which confound the character of the head of Lombard art. With the general tone of his colour is Lombardishque, his drapery resembles the style of Paolo Veronese, and he sometimes approaches the depth of Guercino. To the chief of his excellent pictures, published by the grand duke of the Pegnati family, and dispersed through private collections at Florence, we may refer his Trinity, in the church of St. Croce, his St. Albert, in that of St. Maria Maggiore, the Martyrdom of Stephen, at the Sistcrs of Monte Dominii, which Pietro da Cortona ranked with the principal pictures at Florence. Mr. Anthony converting a Heretic is considered as superior to any other at Cortona. His St. Peter healing the Cripple, in the Vatican at Rome, is placed by Andrea Sacchi next to the Transfiguration of Raphael and the St. Jerome of Domenichino.

The merit of this picture, now indeed utterly destroyed by the humidity of the place, and other circumstances, procured him the title of Cavaliere. This great artist also engraved a few plates in a flight, neat style, evincing, however, the hand of a master. Among others is a small plate representing "Mary Magdalen washing the Feet of Christ, at the Table of Simon the Pharisee." The heads of the figures, which are numerous, are remarkably beautiful; particularly those of our Saviour and Mary Magdalen. He died at Rome in 1513, aged 54. Pilkington and Strutt.

CARDIA, in Anatomy. See Stomach.

CARDIA, in Ancient Geography, a town situated near the Chersonesus of Thrace, at the bottom of a gulf, and to the west of the ilithmus, which joins the peninsula to Thrace, near the mouth of the Meles. It derived its name, according to Pliny, from its being built in the form of a heart. This city was considerable, when it was surrendered to the Athenians, at the time of the contest of the king of Thrace with Philip. They founded colonies in it, in order to secure the possession of it, but afterwards abandoned it. Lyfimachus, the successor of Alexander, demolished it, and from its ruins raised the city of Lyfimachia, in the ilithmus of the Chersonesus. It probably recovered itself, as Ptolemy, five centuries after the reign of Lyfimachus, represents it as a town. There were masts of this city in silver, bronze, and gold, with the symbol of a heart.

CARDIAC, or Cordial Medicine, those substances which, by their stimulant operation, excite a agreeable sensation of warmth in the bosom, and give it a temporary degree of tone. Hence they are also called stimulants. The sensation of warmth is produced partly by the peculiar impression of these substances on the nervous coat of the bosom, and partly by the accelerated circulation in its vessels, which necessarily occasions a greater evolution of caloric. In consequence of the general sympathy of the different organs of the body with the bosom, this stimulant operation is communicated to the heart and arterial syllem, and to the brain or common senium; whence the spirits are raised, a greater propensity to motion and active thought is produced, and the general sensations of the whole frame are rendered more pleasurable. That this extension of the effect takes place in consequence of nervous sympathy, and not by any actual communication of the cordial substance to the different parts of the vessel, is
evinced by the instantaneous manner in which it is effected. Farther than this, we know nothing of the mode in which this operation is accomplished; it can only be stated, as an ultimate fact, that such a relation between the substances, which come under this denomination, and the living body, exists. No hypothesis, such as the older physicians adopted, of a chemical combination of the medicine with the fluids or solids of the body, or of a mechanical action of the one upon the other, renders the operation in the least degree more intelligible.

Although the terms Cardia, from the Greek, xρυπς, and Cordial, from the Latin Cor (both signifying the heart,) imply the same thing; yet a distinction seems to be generally made at present in their application; the term cardiae being confined more particularly to aromatic substances, and cordial being used, as including effient oils, vinous and spirituous liquids, and other diffusible stimulants.

The operation of aromatic substances and essential oils is considerably different from that of vinous and spirituous liquors. The stimulus of the former is more confined to the stomach; they do not affect the sensorium, so as to produce intoxication; they leave a lefs uneasy sensation, when their operation ceases, and therefore produce less necessity for a repetition; and they are much less pernicious to the constitution, as they do not form, when taken in excess, to occasion those morbid derangements of the viscera, (especially of the liver,) which are among the most common and fatal consequences of the abuse of wine and spirits.

Cordials, in moderate quantities, are beneficial in debilitated habits, especially where the digestive powers are weak. They give a temporary strength to the system; and, by their stimulus to the secretory vessels of the stomach, they increase the secretion of the gastric fluid, and thus, by promoting the formation of a nutritious chyle, tend to add a permanent strength to the body.

In the treatment of particular diseases, they may be advantageously combined with the more permanent tonics, as in hysteria, chlorosis, epilepsy, and some others, in which great nervous mobility prevails; with diuretics, in the dropies of old people and of debilitated constitutions; and with narcotic medicines, such as digitalis, cicutia, &c. which are liable to excite naeæs, or otherwise to disagree with the stomach. In the last flages of putrid diseases, as they are commonly called, such as typhous fever, putrid fore-throat, confluent small-pox, &c. they are of incalculable utility, (particularly wine,) and afford the last resources for supporting the sinking powers of life, and for sustaining that force and regularity of circulation, which is necessary to the performance of the functions.

Cardiac orifice, of the stomach, in Anatomy, is the opening by which the esophagus communicates with that receptacle. It is called also the esophageal, the superior, or the left opening of the stomach. See Stomach.

Cardiac opening of the diaphragm, is the superior of the two openings formed between the appendices or crura diaphragmatica, and transmits the esophagus, together with the right and left nerves of the eighth pair, or par vagum. See Diaphragm.

CARDIACA, in Botany, Hall. Helv. n. 274. See Galeobdolon.

Cardiaca, Hall. Helv. n. 275. See Stachys fruticosa.

Cardiaca, Amm. Ruth. 49, 50. Mil. Icon. 80. See Leonurus tataricus.

Cardiaca, five Leonurus. Plak. Alm. S. tab. 118. fig. 4. See Pholmis seyfliana.

CARDIACUS PLEXUS, in Anatomy, is formed by the nerves which supply the heart, and which are derived from the superior and inferior cervical, and first dorsal ganglia of the great sympathetic nerve, from the par vagum and the recurrent nerve. See Heart and Nerves.

CARDIALGIA, in Medicine, a term formerly used in a more general sense to designate any pain or uneasiness about the region of the stomah, especially if connected with a tendency to syncope (Sawange's Nooful. Meth. cl. vii. ord. 4;) but at present confined to that painful sensation of heat and accumivity about the superior orifice of the stomah, which, from the vicinity of its seat to the heart, is popularly called heart-burn. The term is from xρυπς, which signifies both the heart, and upper orifice of the stomah, and αφί, pain.

This painful sensation is produced by the irritation of an acid matter in the stomah, which refers to the upper orifice, sometimes by eructation into the esophagus and throat, and is sometimes completely ejected by vomiting. That this irritating matter is of an acid nature, is evident by the taste; and it has even been seen to produce an effervescence on falling on a marble hearth, according to Dr. Darwin, (Zoonomia, claf. I. 2, 4, 5.) When vomited, or raised by eructation, it is sometimes to intensify four, as to abrade the mouth and throat; and, in general, it produces a sensation in these parts similar to that which exists in the stomah.

The production of the acid is thus accounted for. It has been ascertained by the experiments of Spallanzani and others, that the process of digestion is effected by means of the solvent powers of the gastric juice; and that, during health, while it is perfectly performed, no degree of fermentation occurs. But when, from a deficiency of the solvent fluid, or some morbid change in its quality, digestion is delayed or imperfectly accomplished, the natural chemical changes, which a mass of animal and vegetable matter is disposed to undergo, ensue, fermentation takes place, and an acid is consequently evolved. It is obvious, therefore, that cardialgia is not to be considered as a distinct species of diseases, but as one of the symptoms of indigestion, or of the weaknesses or inactivity of the stomah; and it is produced by all the causes of indigestion. See Dispepsia. Particular kinds of food, however, are liable to produce cardialgia, in those who are pre-disposed to indigestion, rather than the other symptoms which often attend it; such as hot new bread, especially of the corner kinds, rich pastry, &c. It is a very common symptom of that morbid condition of the stomah, which exists in the early and late flages of pregnancy.

The complaint may be palliated by nutritious medicines, such as Spanish liquorice, or gum Arabic, which steth the irritated parts, and, by supplying the deficiency of mucus, preserve the sensible membranous lining of the stomah from the acrimonious fluid.

It may be perhaps relieved, and, if slight, may be effectually cured, by the use of such medicines as may combine with, and neutralize the acid, from which it originates. For this purpose the vegetable or folif alkalies may be employed in various forms; the foda-water, as a common drink, is a convenient form: the absorbent earths, as magnesia, chalk, &c. will answer a similar end. But where the complaint is severe, or of some standing, the only effectual method of cure consists in removing that state of debility of the stomah on which the indigestion depends. This must be effected by temperance and exercise, with the assistance of tonic
tive and stimulant medicines, such as alkali, colonialia, and other bitters, with a moderate portion of wine and aromatics. Care should be taken not to charge the stomach with a larger quantity of food than it can readily digest, since the overplus will necessarily tend to fermentation.

Dr. Darwin remarks, that as the saliva, swallowed along with our food, prevents its fermentation, according to the experiments of Pringle and Macbride, considerable relief is sometimes found by chewing parched wheat or mastic; or, a lack of wool, frequently in a day, when the pain occurs, and by swallowing the saliva thus collected.

CARDIFF, or CARDYFF, in Geography, the county-town of Glamorganshire, South Wales, derives its name from its situation on the river Taf, which runs along the west side of it, and falls into the Severn, three miles below the town. It consists of several spacious streets of well-built houses, and is pleasantly situated on a fertile flat, two miles and a quarter from the eastern extremity of the county, where it is joined by Monmouthshire. The town was formerly surrounded with walls flanked with watch-towers, 1280 paces in circumference, and had gates at the four cardinal points, some traces of which are still visible. Cardiff consists of two parishes, St. John's and St. Mary's, though there is at present but one church: for the church of St. Mary was, in 1627, undermined and thrown down by the inundations of the river, which still occasionally repeats its depredations. The high tower of the present church was built, it is said, at the latter end of the reign of Edward III. It is of light appearance, and of elegant appearance; having open corners and lantern spires. Here were formerly four religious houses: a benedictine priory, and houses of black, grey, and white friars. Thofe of black and white friars were founded by Robert earl of Gloucester, and continued, till the dissolution, under Henry VIII. A few remains of the white friars are still to be seen; and the ruins of the black friars are near the eastern wall and gate-way, and furnish habitations for a few poor fishermen. The chief object of attention is the ancient castle, which is a large, lately edifice, on the north side of the town wall. It was originally of great strength, and is said to have covered eight acres of ground. It was built by the conqueror Ethelhamon, in 1090, after he had possessed himself of the country of Morgannoc. The entrance is by a bold gate-way, furnished with two portcullises and maffy gates. The ruins of the castle have been repaired and modernized under the present possessor, the marquis of Bute. On the keep, which stands in the centre of the enclosed area, is a handsome octagonal tower; and a high terrace is carried round the inside of the whole extent of the embattled walls that surrounded it. This castle, situated in the midst of the Anglo-Norman territory, experienced but few of those incidents so common to many others. It is memorable as the scene of the unjust imprisonment and death of Robert duke of Normandy, by his brother Henry I. In May 1645, it was garrisoned by the Welsh loyalists for the king; but in August the following year, after sustaining a short siege, surrendered to the parliamentary forces. The inhabitants of Cardiff and its vicinity carry on a considerable trade to Bristol, and send thither great quantities of oats, barley, malt, butter, and poultry of all kinds. The ironworks of the adjacent country have greatly added to the revenue of this town, near 9,500 tons of cast and wrought iron being exported annually for London and other places. By an act which passed in 1790, a canal was cut from Penarth Point to the Cyfartha iron-works, near Merthyr Tydvil; which has greatly facilitated the conveyance of so ponderous an article of commerce to market; this canal was brought, with great ingenuity, through a mountainous country, to the extent of twenty-five miles; its head, at Merthyr Tydvil, is 508 feet higher than the lock-locks at Cardiff. By a subsequent act a branch has been extended to other works at Aberdare, and the division of the line below the town has been widened and deepened, so as to admit brigs and other vessels of 600 tons burden up to the quay. See Glamorganhire Canal. The offices are regularly held at Cardiff; and the beauty of the neighbourhood is sometimes displayed at its concerts and assemblies. By the late return the population of this town is 1870, and the number of houses 527. It is 160 miles W. from London, and has two weekly markets on Wednesdays and Saturdays.

About three leagues south of Cardiff are two islands, called the Flat and Steep Holms; on the former of which there is a light-house, and a good dwelling, where pilots frequently wait to conduct ships up the Bristol channel: this island contains sixty acres of land, and is well cultivated. A little to the west of these islands is a small one called Sulley, and three miles westward of that is another named Barry, from St. Baruch, who is said to have been interred there. Evans's Tour through South Wales, 8vo. 1824. Malkin's Scenery, Antiquities, &c. of South Wales, 4to. 1824.

CARDIGAN, in Welsh Aberteifiw, is the county-town of Cardiganshire, in South Wales. The houses stand on the declivity of a hill, at the bottom of which runs the river Teif or Tivy, which has at its mouth a dangerous bar. This is navigable at high tides for brigs of 150 tons burden, which are laden and unladed at the quay. Previous to the war here was a considerable export trade to Ireland, &c. in lead and corn; but the iron works in the vicinity furnish it, at present, with its chief commerce. About two miles from the town the river discharges itself into Cardigan-bay. A bridge of seven arches crosses the river, and near it stands the shell of a castle, which is said by many writers to have been built by Gilbert de Clare, who also fortified the town, in the time of Henry II. Powell, however, in his "History of Wales," affirms, that a castle was built here, in 1155, for the defence of the borders. This was besieged by Rhys Gryfyndid, in 1164, when it was taken, and razed to the ground. In 1176, Cardigan was a feese of peculiar public felicity, when numbers of English, Welsh, Irish, and Normans, assembled to celebrate a grand eisteddfod. The bards and minstrels of the principality displayed pre-eminent skill on this occasion. They, consequently, record the approbation and thanks of the assembly; and, being victors, were rewarded with honorary presents. In the poetical clafs, the bards of North Wales were declared the most eminent; and, in music, the minstrels of South Wales proved themselves the conquerors.

On the banks of the river stand the church, a large handsome structure; and near it are the ruins of a priory of black canons. In 1797, a new county-gazet was erected in this town. Cardigan is noted as the place where Gyraldus preached, and strongly recommended the crusade to the ancient Britons. Though the county-town, Cardigan has but little to recommend it to the attention of the historian or antiquary. Its houses and shops are upon a very small scale, and its local trade is but very inconsiderable. In conjunction with the outlying boroughs of Aberystwith, Lampeter, and Adpar, this town sends one member to parliament. The number of voters amounts to about 1200. Cardigan gives the title of earl to the family of Bcludel. Here are a weekly market on Tuesdays, and a fair annually. Evans's Tour through South Wales, 8vo. 1824. Malkin's Scenery, Antiquities, &c. of South Wales, 4to. 1824. 3 Y 2
The cardinal points, therefore, coincide with the four cardinal regions of the heavens; and are 90° distant from each other. The intermediate points are called collatereal points.

Cardinal Points of the Heavens, or, of a Nativity, in Astrology, are the rising and setting of the sun, the zenith and nadir.

Cardinal Signs, in Astrology, are Aries, Libra, Cancer, and Capricorn. See Sign.

Cardinal Winds are those that blow from the cardinal points.

Cardinal Numbers, in Grammar, are the numbers one, two, three, &c. which are indeclinable; in opposition to the ordinal numbers, first, second, third, fourth, &c. See Number.

Cardinal is more particularly used for an ecclesiastic prince, one who has a voice, both active and passive, in the Roman conclaves, at the election of a pope.

Some say, the cardinals were so called from the Latin intercalatio, which signifies the adoption in any church made of a priest of a foreign church, driven thence by misfortune; and add, that the use of the word commenced at Rome and Ravenna; the revenues of the churches of which cities being very great, they became the common refuge of the unhappy priests of all other churches.

The cardinals compose the pope's council, or senate; in the Vatican is a constitutive of pope John, which regulates the rites and titles of the cardinals; and which declares, that as the pope represents Moses, so the cardinals represent the seventy elders, who under the pontifical authority decide private and particular differences.

Cardinals, in their first institution, were only the principal priests, or incumbents of the parishes of Rome. In the primitive church, the chief priest of a parish, who immediately followed the bishop, was called presbyter cardinalis; to distinguish him from the other petty priests, who had no church, nor preferment; the term was first applied to them in the year 150; others say, under pope Silvester, in the year 500. These cardinal priests were alone allowed to baptize, and administer the eucharist. When the cardinal priests became bishops, their cardinalate was vacated; they being then suppos'd to be raised to a higher dignity,—under pope Gregory, cardinal priests, and cardinal deacons, were only such priests or deacons as had a church or chapel under their particular care; and this was the original use of the word. Leo IV., in the council of Rome, held in 853, calls them presbyteri sui cardinalis; and their churches parochiæ cardinalis.

The cardinals continued on this footing till the eleventh century; but as the grandeur and state of his holiness became then exceedingly augmented, he would have his council of cardinals make a better figure than the ancient priests had done. It is true, they still preferred their ancient title; but the thing expressed by it was no more. It was a good while, however, before they had the precedence over bishops, or got the election of the pope into their hands; but when they were once possessed of those privileges, they soon had the red hat and purple; and growing still in authority, they became at length superior to the bishops, by the sole quality of being cardinals.

Du Cange observes, that originally there were three kinds of churches: the first or genuine churches were properly called...
called parish: the second, decon
eorities, which were chapels
joined to hospitals, and served by deacons; the third were
simple oratories, where private masses were said, and were
discharged by local and resident chaplains. He adds, that
distinguishing the principal, or parish churches, from the
chapels and oratories, the same cardinal was given them.
Accordingly, parish churches gave titles to cardinal priests;
and some chapels also, at length, gave the title of cardinal
deacons.

Others observe, that the term cardinal was given not
only to priests, but also to bishops and deacons who were
attached to certain churches; to distinguish them from
those who only served them as chaplains: and by commis
sion. Titular churches, or benefices, were a kind of pa
rihes, i.e. churches assigned each to a cardinal priest;
with some flated district depending on it, and a host for
administering of baptism, in cases where the bishop him-
sclf could not administer it. These cardinals were subor
dinate to the bishops; and, accordingly, in councils, par
cularly that held at Rome in 868, subscribed after them.
It was not, however, only at Rome, that priests bore
this name; for we find there were cardinal priests in
France; thus, the curate of the parish of St. John de
Vignes is called, in old charters, the cardinal priest of
that parish.

The title of cardinal is also given to some bishops, qua
temus bishops; e.g. to those of Mentz and Milan; the arch
bishop of Bourges is also, in ancient writings, called car
dinal; and the church of Bourges a cardinal church. The
abbot of Vendome calls himself cardinallis nates.

The cardinals are divided into three classes, or orders;
containing six bishops, 50 priests, and 14 deacons; making
in all, 75: which constitute what they call the facned col-
lege. The cardinal bishops, who are as it were the pope's
vicars, bear the titles of the bishopricks affixed to them;
the rest take such titles as are given them; the number of
cardinal bishops has been fixed; but that of cardinal priests
and deacons, and consequently the facned college itself, is
always fluctuating. Till the year 1125, the college only
consisted of 52, or 53: the council of Constance reduced
them to 24; but Sixtus IV. without any regard to that
reduction, raised them again to 53, and Leo to 65. Thus,
as the number of cardinal priests was anciently fixed to 28,
new titles were to be established, in proportion as new car
dinals were created.—As for the cardinal deacons, they
were originally no more than seven, for the 14 quarters of
Rome; but they were afterwards increased to 19, and after
that were again diminished. It has been said, however,
(see Molheim, E. H. vol. ii. p. 485) that cardinal deacons
were not from the beginning members of that facned col-
lege, by whom the popes were elected. Although there
were in the Roman church long before the edict of Nicho
las (mentioned below), and there still remain, cardinal dea
cons, i.e. superintendents of those churches which have
hospitals annexed to them, and whose revenues are appropri
ated to the support of the poor; yet they were evidently
excluded from the election of the pope, which, by the
edict of Nicholas, was to be made by the cardinal bishops
and clerks alone. Accordingly we find the cardinals plainly
distinguished from the deacons in the diploma that was
drawn up for the election of Gregory VII. to the pontificate.

According to Onuphrius, it was pope Pius IV. who first
enacted, in 1562, that the pope should be chosen only by
the senate of cardinals: whereas, till that time, the election
was by all the clergy of Rome. Some say, the election of the
pope rests in the cardinals; exclusive of the clergy, in the
time of Alexander III. in 1160. And they allege, that,
in order to avoid the usual contentions and disturbances at
the election of a pope, he made a decree in the third Lat
teran council, A.D. 1179, that for the future the right of
choosing him should be vested in the cardinals only, and
that he should be a lawful pope who had the suffrages of
two-thirds of the college of cardinals: which law is still in force.
See Alexander. Others go higher still, and say, that Nicho
las II. having been elected at Siena, in 1059, by the cardinals
alone, occasioned the right of election to be taken from the
clergy, and people of Rome, only leaving them that of
conferring him by their consent; which was at length,
however, taken from them. See his decree for this pur
pose, issued in the Roman council of 1079, in Hardonni's
Acta Conciliorum, tom. vi. p. 1155. "We have
thought proper to enact," says the pontiff, "that, upon
the decease of the bishop of the Roman catholic or uni
versal church, the affair of the election be treated prin
cipally, and previously to all other deliberations, among the
cardinal bishops alone, who shall afterwards call in to their
council the cardinal clerks, and require finally the consent
of the rest of the clergy and the people to their election."

Whence it appears, that the cardinals who had the right of
suffrage in the election of his successors, were divided by
this pontiff into cardinal bishops and cardinal clerks:
meaning by the former the seven bishops who belonged to
the city and territory of Rome, and to whom it belonged
to consecrate the Roman pontiff; and by the latter, the
cardinal prebendaries or minifters of the 28 Roman parishes,
or principal churches. To these were added, in process of
time, under Alexander III. and other pontiffs, new mem
bers, in order to appease the tumults occasioned by the
edict of Nicholas II. Accordingly Alexander completed
what Nicholas had only begun, by transferring and confi
ning to the college of cardinals the right of electing to the
apostolic see, and excluding the nobility, the people,
and the rest of the clergy from all concern in this important
matter. In order to defeat the opposition of the higher
order of clergy, he augmented the college of the electing
cardinals by conferring that dignity upon the prior, or arch
prebendaries of St. John Lateran, the arch-prebendaries of St.
Peter's and St. Mary Maggiore, the abbots of St. Paul's
and St. Laurence without the wall, and, lastly, upon the
seven Palantine judges. And the inferior clergy were re
duced to silence by the promotion of their chiefs, the car
dinal deacons, to the dignity of electors. Who it was, that
Alexander III. or some other pontiff, that raised the
principal Roman deacons to the rank of cardinals, is not
certain; but it is very evident, that the design of this pro
motion was to put an end to the murmurs and complaints
of the inferior clergy, who resented highly the violation of
their privileges.

We may conclude, upon the whole, that the college of
cardinals, and the extensive authority, and the important
privileges enjoyed by them at this day, derive their origin
from the edict published at the request and under the pon
tificate of Nicholas II.; that, under the title of cardinals,
this pontiff comprehended the seven Roman bishops, who
were considered as his suffragans, and of whom the bishop
of Ohia was the chief, as also the 28 minifters, who had
inspection over the principal Roman churches; and that to
these were added, in process of time, under Alexander III.
and other pontiffs, new members, in order to appease the
resentment of those who looked upon themselves as injured
by the edict of Nicholas, and also to answer other purposes
of ecclesiastical policy. It is also unquestionable, that,
though the higher order of purpled prelates, commonly
called cardinals, had its rise in the 11th century, yet it does
The cardinals obtained the privilege of wearing the red hat as an emblem of their readiness to shed their blood for the Catholic faith, in consequence of the grant made to them by Innocent IV. at the council of Lyons, in 1245; but they are said to have first used it in the year after the council, i.e. in 1246, on occasion of an interview between the pope and Lewis IX. of France. That the cardinals were allowed to wear red shoes and red garments in the time of Innocent III. raised to the see in 1198, appears from several writers who flourished at that time; but it is not certain which of the popes conferred upon them that distinction. Paul II. erected to the papacy in 1464, added the red cap and scarlet houffons for caparisoning their horses when they rode. The decree of pope Urban VIII. wherein it is appointed, that the cardinals be addressed under the title of cardinalis, is of the year 1645; till then, they were called illugitmississi.

See further concerning the origin and rights of cardinals in Compiègne, Ducreux, Cucoons. Aubrey has given the general history of cardinals, in five volumes, 4to.

CARDINAL has also been applied to secular officers.

Thus, the prime ministers in the court of the emperor Theodorus, are called cardinalis. Cañidus, lib. vii. Formul. 41. makes mention of the cardinal prince of the city of Rome; and in the list of officers of the duke of Bretagne, in 1447, we meet with one Raoul de Thorel, cardinal of Quillart, chancellor, and servant of the vicomte de Rohan: which shews it to have been an inferior quality.

CARDINALIS is found, in Geography, a small island near the east coast of Labrador. N. lat. 59° 30'. W. long. 63° 50'.

CARDINAL, bird, in Ornithology, synonymous with Cardinalis and Loxia cardinalis.

CARDINALIS capitis bona feei, Brill. and Cardinal du cap de bonne espérance, Buff. See Loxia oris, the grandier of English writers. Le cardinal of Buffon is another bird, the Gmelinian Tanagra brasilia, which see. Cardinalis purpureus of Brill. is the Jazauchen of Marcgrave, Tanagra junta of Gmelin. Cardinalis is also the specific name of several birds in the Linnaean system, as will be noticed in their respective genera.

CARDINALITIUS, a name given by fome to the Virginian nightingale, Loxia cardinalis, which see.

CARDE, in the Manufactures, a preparation of wool, cotton, hair, or flax, by palling it between the iron points, or teeth, of two instruments, called cards, to comb, digest, and range the hairs or fibres thereof; and to dispose it for spinning, &c. See CARDS.

Before the wool be carded, it is oiled, or greased with oil; whereof, one-fourth of the weight of the wool is required, for wool destined for the wool of fiftas; and one-eighth for that of the warp. See Cloth.

CARDIOGUS, or Cardiogochus, (compounded of xéza, the heart, and ýgus, tumour) in Medicine, a dilatation of one or all the cavities of the heart. The term includes two species of dilata; viz. a partial enlargement of the heart, forming a sac, in which conglabulums is deposited, and which is usuallc denominated aneurysm of the heart; and that more common dilata, which confids chiefly in a general dilatation of the natural cavities.

The symptoms which belong to aneurysm of the heart are the same as those which accompany aneurysm of the arch of the aorta. (Baillie Morb. Anim. p. 422) See Aneu-

When the heart, or any of its cavities, is much enlarged, it is attended with fever palpitations, which are excited by the least motion or exertion, and often accompanied with sighs and difpiriting paroxysms; so that they may not only be felt by the hand, when applied to the left side, but at the pit of the stomach, and at the top of the sternum; and they may frequently be perceived by the eye through the ordinary clothing, and occasionally, it is said, may even be heard.

The other symptoms are, a fene of weight, and a constant anxiety about the chest; sometimes accompanied with a violent pain across the breast, in the abdomen, or the back; and sometimes with fainting. There is frequently great difficulty of breathing, with a fene of suffocation, which compels the patient to fit in the erect posture, or to seek repose by leaning on his breast. A purplish hue of the cheeks and lips, which varies at times, according to the degree of difticulty with which the blood is transmitted through the lungs; edema of the face, or other droptical swellings; fluctuance of the stomac; and a burning cough, are occasional symptoms of the complaint. The pulse is various in different infances; sometimes it is feeble, small, and intermitting; sometimes extremely quick and hard; and sometimes not pulsated with any contractions of the heart. When the palpitation is violent, the head is often affected with strong dilatting pulsations, which are sometimes more complained of than those of the heart itself.

The diagnosis of this affection of the heart is of considerable importance; because the most dreadful palpitations occasionally arise from morbid irritability, independent of organic disease; and the treatment must necessarily be very different in the two infances. The enlargement of the heart is generally perceptible to the hand; its stroke is less pointed, or more obtuse than natural, and is felt two or three ribs lower than in health. But, according to Dr. Ferrier, "the most certain sign of dilatation is the jarring fenfation given to the hand by each fyltole. The fyltole fears restrained, and is succeeded by a kind of thrilling, which cannot be clearly defcribed, but is entirely different from the fhake of a palpitation." (Med. Hist. and Refl. vol. i. p. 148.) Senac, with fels dilution, observes, that our principal guide, in determining the dilatation of the heart, must be the force of the palpitations, their continuance, and the facility with which they are excited, especially if accompanied by syncope and dyspnoea. (Traté du Cœur, tom. ii. chap. 8.) The symptoms, however, are sometimes obfcur and treacherous.

It is more difficult, and of less importance, to determine which of the cavities of the heart is dilated. Where the auricles only are dilated, probably the pulse will retain its strength, as the ventricles poffefs their natural power; the palpitation will perhaps be less violent; and the enlargement less perceptible to the hand. (Senac.) And the dilatation may be considered as confined to the auricles, when the palpation feels remote, and extends across the breast, as well as downwards, and when the apex of the heart does not frike the ribs very forcibly. (Ferrier.) M. Senac has farther observed, that when the right ventricle, or its auricle, is greatly dilated, the palpitations are comparatively trifling; the patients complain chiefly of a fene of weight about the region of the heart; and there is also a palpitation in the veins of the neck.

In several infances there has been a great disposition to gramineous and very thin, in proportion to the enlarged size of its cavities, the heart has little power to propel an increased quantity of blood into
means of arresting the progress of the disorder. Analogy corroborates this suggestion: for in other partial constrictions, and in collars, tones, and even direct stimulants, we are given with advantage, to recover the tone of the dilated or ruptured vessel. (Ferriar, loc. cit. p. 168.)

CARIOIDE, in Geometry, a curve so called by Cafl.

Carter. When this is formed, let the diameter A B (Plate III. Geometry, fig. 48.) of the circle A M B A, resolve about the point A, and on A B produced let B a, M N, A D, M N, &c. he always equal to A B; then will the point a describe a curve, which from its figure resembling a heart, is called cardioide.

From the construction it appears, that A N = B A + A M, and that M N M A is always double of the diameter A B, and is bisected by the circle in M.

This curve is algebraical; if A B = a, a E = x, E N = y, its equation will be,

\[ y = \frac{6a y^2 + 12x y - 6a x^2 + y + x}{12a x^2 + 8a y + 3a x^2 = 0} \]

For the method of drawing tangents, and other properties of this curve, see Phil. Trans. N. 261. sect. 8. See also Mem. Acad. Science. 1759, where M. Caret first proposed this curve.


Gen. Ch. Cal. perianth four-leaved; leaves obtuse, con-

Carpal; the alternate interior ones larger than the others. Cor.

pals four, obtuse, alternate with the leaves of the calyx, equal in size to the two larger ones. Necary four petal-

formed leaflets, coloured, inclosing the germ, shorter than the proper petals, and attached to them; two of them callous at the tip, hooked at the side, forming an upright lip; the others with equal sides forming a closed lip. Stem. filaments eight, awl-shaped, nearly as long as the nectary, united be-

anthers small. Pfii. germ three-fidged; styles three, short; stigmas fimple. Piericarp. capsule roundish, three-

lobed, inflated, three-celled, opening at the tip. Seeds glo-

bular, marked at the base with a heart-shaped scar. Gart-

ner and La Marek consider this peculiar as containing three conurate, one-celled, valvaceous capsules, united at the axis so as to take the appearance of a three-celled capsule.

Eff. Ch. Calyx four-leaved. Petals four; nectary four-

leaved, unequal. Capsule three-leoved, or rather three conurate capsules inflated.


fig. 2. Pfiifnerificarium, Bauh. pin. 743. Sloane Hist. 1. p. 238.)

"Steam and petioles smooth; leaflets with grafted teeth, smooth." Wild. Root annual. Stems three or four feet long, slender, branched, bristled, twining. Leaves alternate, twice ternate, sometimes slightly pubescent. Flowers small, white, common peduncles axillary, solitary, thread-shaped, fursished above the middle with two simple, opposite tendrils, and supporting several flowers near their extremity on short partial peduncles. Fruit short, greenish, almost smooth. A native of the East and West Indies; cultivated in England by Gerard in 1594. It flowers here in July. 2. C. irifimum, Wild. "Steam and petioles hairy; leaflets toothed, smooth." Root annual. Stem four feet high or more, climbing, deeply furrowed, thick set with hairs. Leaves alternate, petioled, twice ter-

tate; leaflets egg-shaped, acuminate, two inches and a half long, half an inch broad, simply and coarsely toothed, smooth on both sides, revised; axes of the veins pubescent

beneath

into the more dilatant branches of the arterial system. (Mor. Anat.)

In whatever cavity the dilatation exists, the disease is commonly fatal. The patients generally die suddenly, in syncope, or in a paroxysm of palpitation; sometimes in consequence of a rupture of the thin pericard of the dilated cavity, but often without any such rupture. The disease, however, is extremely irregular in its progress, and in its duration. It will sometimes appear to be stationary, or even retrograde, for a long interval, during which the sensations of the patient are tolerably comfortable, and he can use moderate exercise without inconvenience. At other times the paroxysms are frequent, and he seems in perpetual danger of expiring. The duration of the complaint has been observed, in different instances, to vary from two or three months to nine years.

Various causes have been assigned for this disease. Senac enumerates in the list, all acute diseases of the lungs, as well as althama and hydro-oxythax, fever, violent exercise, or turbulent pulsions, and excessive incontinence. According to Lancet, flute-players and preachers are subject to it; and Dr. Pictain thinks that he has observed it arise from a transference of rheumatism to the heart. Dr. Ferriar has seen it produced by raising great weights, or by too long a continuance of much bodily exertion; and all the cases which he has seen have been in young persons. It is probable that any circumstance which either acts as a strong impediment to the free passage of the blood from the heart, or which excites a violent and long-continued allusion of blood to that organ, may, in some congratulations, where there is an original weakness of it, occasion a dilatation.

Little can be said as to the cure of dilatation of the heart; for, except in the indigent flaque, all that can be done is to soothe the distressing feelings of the patient, to render his existence somewhat more comfortable, and thus perhaps to prolong its duration. With this view, much has often been done by medicine and proper management. The anxiety and palpitation may be alleviated by means of narcotic medicines, especially by digitalis and opium, which diminish the irritability of the heart and arterial system. The digitalis is sometimes extremely useful in this complaint, and has appeared to suspend its progress, and to produce long intervals of freedom from the distressing symptoms. Perhaps it may be serviceable partly as a narcotic, and partly as a diuretic; since diuretics, whatever may be the explanation, give frequent relief in disorders of the chest. All violent exercise, and great emotions of the mind, should be avoided, since they tend to produce inordinate action of the heart. Moderation in diet should be observed, and strong liquors dispensed with; so that the stomach may not, by dilution, press upon the heart, and excite it to increased action, and that the body be not heated and irritable from the quantity or quality of the food and drink. Great flatulence, or other occasional symptoms, must be palliated by appropriate medicines.

It ought not to be omitted, that in the commencement of the disease some physicians have recommended evacuations, especially by bleeding, with a view to remove the fulness of the vesicles, and therefore to diminish the mechanical momentum of the blood in the heart, as well as its stimulus to that irritable organ. This doctrine is, however, somewhat questionable. It is justly remarked by Dr. Ferriar, that the symptoms of debility which generally accompany the complaint, even at its commencement, the tendency to deliquium (fainting), the weak aflatant state of the stomach and bowels, the drophical symptoms, owing to a delay in the return of the blood, and the languid feelings of the patient, seem to point out a careful exhibition of tonics, as the most probable
CARDIUM. Beneath certain periodical almost three inches long, furred, hairy; partial glands an inch or half an inch long, fennel-cylindrical, not often furred with hairs. Flowers similar to those of the preceding species, but larger; peduncles half a foot long, furred, smooth. A native of Guiana. 3. C. cardium, Linn. Sp. Pl. "Leaves downy underneath." Similar to C. hildebrandum. Root annual. Peduncles supporting ten or eleven flowers among the tendrils, remaining, after the fructification is past, rigid. Capsules narrower, downy. A native of Brazil. 4. C. grandiflorum, Willd. Swartz. Prod. 64. Flor. Ind. Occid. 2. p. 658. "Leaves pubescent; capsules acuminate, very large." Root perennial. Leaves more acuminate than those of C. cordium, and inclining to heart-shaped at the base. Flowers and fruit three or four times as large. A native of Jamaica.

CARDISPERMUM. See Calendula hybridia.

CARDISSA, in Conchology, the name given by Rumphius to the Linnean Cardium cardisii.

CARDITIS, in Medicine, the nosological term for inflammation of the heart.

If we consider the nature and importance of the function of the heart, and the connection of the circulation, of which it is the source, with the nervous system, the state of temperature, and every other function of the body, we should be led to expect, à priori, that the symptoms accompanying an inflammation of that organ, would be sufficiently obvious, and essentially different from those, which designate an inflammation of any other of the viscera of the thorax. This, however, is very far from being the case. The symptoms which attend inflammation of the heart, are fever, pain in the situation of the heart, palpitations, an irregular pulse, cough, difficulty of breathing, and often syncope. (Baillie Med. Anat. p. 42.) It is obvious that the symptoms here enumerated are merely the common symptoms of peripneumony, or pleurisy, with the addition of palpitation, irregularity of pulse, and syncope, or fainting. But it is observed by Senac, that these symptoms are extremely uncertain; and with regard to palpitation, although its presence may lead us to suspect that the heart is affected, yet it is probably an hypothetical opinion, since in that inflammation, which arises from wounds of the heart, palpitation does not occur. (Tracté du Cœur, tom. ii. chap. 7.) With respect to the other two symptoms it must be remarked, that the presence of an irregular pulse, and the occurrence of syncope, together with the symptoms of peripneumony (or inflammation of the lungs), can only lead to a probable supposition of an affection of the heart, since they are by no means constant attendants on carditis; and the former very frequently attends other cases of pneumony. (Willan on Febris Difseas, vol. iv.) Upon the same grounds Dr. Cullen agrees with the observations of Vogl, that "the symptoms of carditis are nearly the same with those of peripneumony, but in general more severe;" and adds, that he has seen the pericardium, or membranous covering of the heart, inflamed, when no other symptoms, but those of peripneumony, had occurred. (Synopsis Med. Meth. p. 107. note.) Inflammation of the pericardium, however, cannot be distinguished in practice from inflammation of the substance of the heart. (Baillie, loc. cit.) In fact, inflammation seldom occurs in any part of the contents of the thorax, without spreading to the pleura in contact with it, as from the pleura to the lungs, from the heart to the pericardium and pleura, &c. Hence the diagnosis must be obviously impossible in many cases, where in reality more than one organ is inflamed.

Were we to collect, however, of any certain means of distinguishing carditis from inflammation of the other thoracic viscera, in a practical point of view it would be of little use, since the method of cure must be the same, whether the disease be seated in the lungs, pleura, heart, or pericardium. General blood-letting, where the pulse is hard and thready;binders to the region of the heart; gentle laxatives of colonial or neutral tinctures; diaphoretics, and diuretics; will be the principal expediency; every thing being at the same time avoided which can increase the local or general irritation.

The same causes must be considered as giving rise to carditis, which produce the other modifications of thoracic inflammation; and the same circumstances will direct us in forming our prognosis, and in adopting particular varieties of treatment. See Peripneumony.

It would appear from diffusions, that there is often a slow or chronic inflammation subsisting in the heart, which does not betray itself by any peculiar symptom. For abscesses in the sultriness of the ventricles, and ulcers on the external surface, have been occasionally found after death, when no symptoms of inflammation had previously existed. (Morgagni Epit. xxv. art. 17. Bonet, tom. i. p. 849, &c.)

CARDITO, in Geography, a town of Naples, in the province of Calabria ultima, 3 miles E.S.E. of Reggio.

CARDIAM, in Conchology, a Linnean genus of bivalves, the shell of which is nearly equilateral, equale, and in most species, convex, longitudinally ribbed, striated, or grooved, with a dentated margin: hinge with two teeth near the beak, and a larger, remote, lateral tooth on each side in both valves, and which, when the shell is closed, lock into each other. Animal inhabitant of the shell a tetys, having two small pores on the left side of the body.

COSTATUM. A large species described by Linnaeus that inhabits the African Ocean; the shell is gibbous and equale with raised, carinate, concave, membranous ribs. Muf. Lud. Ulr.—Concha esculenta, Argenville, Koman Adanfon.—Length three inches; breadth three inches and a half; general colour white, with sometimes broad brown grooves or stripes. Called by Englishcollectors the Pipe-ringed cockle.

CARDISSA. Shell heart-shaped; valves compressed and carinated with teeth; beaks approximate. Linn.—Cardissa of Rumphius, and Cera ceris of Argenville.

Smaller than the preceding, the length being only two inches and a half, and the breadth two inches. The ribs are placed obliquely, and there is a conspicuous heart-shaped depression before the beaks; the general colour is whitish sometimes spotted with fawnish colour. Individuals of this species according to Greville are occasionally found concave on one side. It inhabits the Indian Ocean.

ROSEUM. Shell heart-shaped; anterior part furred with lines, posterior flatter rather broader, and forming by their conjunction a cordate figure; one part convex, the other concave. Argenville, &c.—This inhabits the Nicobar islands, and resembles the former; shell whitish varied with rose-colour.

RETUSUM. Shell heart-shaped; valves striated, crenulated, and slightly carinated, with lunate cordiform gape behind the beaks.—This shell, which is two inches long, and nearly the same in breadth, is of a milky-white colour, thick, with the anterior part concave, and posterior convex; margin with plaited teeth. Inhabits India, Arabia, and Egypt. Born, &c.

HESICARDIUM. Shell heart-shaped, somewhat quadrilateral; valves carinated; beaks dilatant. Linn.

This is described as an inhabitant of the Indian Ocean; it resembles Cardium Cardisii; and is of an ochraceous colour, a few of the ribs are glabrous, the vent nodules with intermediate grooves wrinkled and marked with excavated dots; shell within snowy-white.
LINN. — Shell heart-shaped, carinated, anterior part obliquely truncated, thin, very smooth, glossy with golden coloured fibre; margin demarcated. Kremen. Ed. Ru-dolph.—Shell above an inch long; its native place unknown.

Medium. Shell somewhat heart-shaped, and slightly angulated; valves angulated, smooth, and fuscated. Linn. &c.

Inhabits American Seas. This resembles Cardium Her-mium; the shell is whitish, and generally fpotted with chefnut or brown; ribs numerous; hinge with a single primary tooth.

ACULATUM. Shell somewhat heart-shaped, with prominent ribs grooved down the middle and beft with large hollow aculations, and tub-petalous spines towards the circumference. Inhabits the Mediterranean and European seas. This is a large species of a brownish colour, or whitish variegated with brown bands. Found on the British coasts. Donov. Brit. Shells, &c.

ECHINATUM. Shell somewhat heart-shaped, fculcated, with fpinous carinated ribs. Linn. &c.—Inhabits European seas.

Rather resembles the left in figure, but is smaller, and paler in colour; whitish, variegated with brown. Found on the British coasts. Donov. &c.

CILIARE. Shell somewhat heart-shaped, with triangular elevated ribs beft along the edges with thin spines, Gmel. &c. A native of the African and European coasts; whitish with about eighteen ribs.

CULATUM. Shell somewhat heart-shaped, with elevated sub-triangular ciliated ribs. Inhabits the North Seas. O. Forbr. &c.

This resembles Cardium ciliare, from which it differs, among other particulars, in having about twice the number of ribs: colour cincereous, or greyish-white.

TUBERCULATUM. Shell somewhat heart-shaped, with obtuse, knotty, transversely fpirated grooves. Linn. Inhabits the Mediterranean sea, and is variously coloured and marked; sometimes white, or whitish with brown bands; sometimes brown with darker bands; ribs from twenty to twenty-three in number, convex, with a few nodalties.

ISOCARDIA. Shell heart-shaped, with arched imbricated fanses along the furrows. Linn.

An American species about two inches and a half in length, and two inches and a quarter broad; colour cincereous-white, with a few red spots or clouds; shell within white, and purple in the middle, and a single primary tooth in each valve at the hinge.

FRAGUM. Shell somewhat heart-shaped, and slightly angulated with elevated lunules down the grooves. Linn. Fragum album of Rumph.

Inhabits India. Colour white, with yellow, or sulphur lunules; within snowly; ribs flatfeft. Perhaps a small variety of the following species.

USnea. Shell somewhat heart-shaped, with lunate coloured grooves. Linn.

This inhabits India, and resembles Cardium fragum, but is twice as large, and has fewer red scales on the grooves; lips of the anterior edge incumbent.

MURICATUM. Shell somewhat heart-shaped, furrowed, and muricated at the sides. Linn.

A native of the American seas; colour cincereous, white or yellowish, mixed or fpotted with bay; margin fuscated; hinge with two red stripes within.

MAGNUM. Shell oblong, with angular grooves fuscated at the edge. Linn.

A supposed variety of this species is called the buckle by Martyn. Dons. Cones. Cardium magnum inhabits India, and America; the shell is fculcated on the margin with twenty or thirty grooves, and transversely wrinkled. Colour variable, yellowish, or brownish, with diffuse spots or tawny, and discolorus with blackish spots; within white.

FLAVELLUM. Shell somewhat heart-shaped, flattened, anterior margin fuscous, posterior one toothed. Linn.

A native of India. Back and posterior flat generally yellow, and sometimes spotted, the red white; this about twenty-seven in number, of a convex form, with the first five or six armed with fliamp spines; twelve or thirteen posterior ones with flat furrows, the intercalated ones smooth.

LAVATUM. Shell oblate, with obsolete longitudinal fliars. Linn.

This kind inhabits the American, Atlantic, and European seas. Length about two inches and breadth nearly the same: colours various, generally brown or tawny, with darker clouds and spots, and sometines bands.

SERATUM. Shell oblate, smooth, with obsolete fliars, ferrated at the interior margin. Linn.

A native of the Mediterranean and Indian seas; shell smaller and less convex than Cardium lavatum; of a yellow colour, with the backs reticulated.

ENOLE. Shell antiquated, with about twenty-eight flatfliars. transversely fpirated with obsolete recurved imbrication.

This is our common buckle, a species found in the greatest plenty buried in the sands on all the arid shores of Europe. The animal inhabiting this shell has a peculiar flavour, and is esteemed as a wholesome and palatable food; the species varies in size and colour, they occur of a large size on some of the Scottish shores. Donov. Brit. Shells.

ISLANDICUM. Shell fuscated, with about thirty-six smooth triangular ribs. Chemn.

Inhabits the North Seas, especially near the coasts of Iceland and Greenland; in its general aspect it resembles our common buckle, cardium edule, but the grooves are deeper and more numerous, and there are no fliars except the outer margin; colour blackish, sometimes banded.

GROENLANDICUM. Shell glabrous, thin, mufch colour, with angulated ferruginous lines; margin glabrous with obsolete longitudinal lines. Chemn.

Same habitat as the former, about two inches and three quarters long, and three inches and a half broad; sometimes banded with brown.

RUSTICUM. Shell with twenty remote grooves, the intermediate spaces rugged. Inhabits European seas. Gemel. &c.

Of the specific name rusticum has been affigned to more than one or two different species of this genus; the C. rusticum of some English writers is probably only a variety of C. edule. Vide Donov. Brit. Shells. C. rusticum of Chemn. may be distinct, but that is doubtful.

GLAUCUM. Shell subfusired, anterior part glaucous; posterior part with twenty grooves imbricated upwards; beaks violet. Poiret.—Inhabits the shores of Barbary. A small species.

PECINATUM. Shell somewhat heart-shaped, and pecified. Linn.—Found in the Mediterranean sea. General colour white, with the cavity under the beaks yellow; valves marked with dilated frize that are rough upwards; margins of the shells prominent.

VIRGINUM. Shell triangular, rounded, equilateral, with transverse membraneous recurved wrinkles; hinges blue. Gemel. &c. Inhabits the Mediterranean. A variety is found in the Indian and American seas.


3Z. AURICULA.
CAR

AURICULA. Shell heart-shaped, and slightly rhombiform with twenty-four ribs on each side; the grooves very finely crenulated; beaks crenulate.

Described by Forckel as a native of the Arabian seas; shell white and pellucid, two inches and a quarter long, and one inch and three quarters broad; margin of the back revolute and toothed.

TRISTE. Shell ovate and smooth; margins both of the anterior and posterior slope flattened. Linn.

Native place unknown. Shell smooth, cincereous, and radiated with white; beaks reflected.

MONSTROSUM. Shell gibbose, one side impressed and ochraceous, the other convex heart-shaped, and whitish spotted with yellow; valves with dentated ridges. Chemn. - This is a very rare species; inhabits the Nicobar islands.

LIMA. Shell gibbose with aculeated ribs, the anterior ones with recurved membranous tubercles created at the sides; the intermediate grooves granulated. Chemn. Inhabits the Nicobar islands. This shell is ochraceous, with the anterior margin flesh-colored, and the beaks reddish. A supposed variety of this species is described by Schenck, in which the ribs are more rounded, and instead of being aculeated or prickly only granulated.

RINGENS. Shell rotundate, ventricose, and white, with deep teeth at the margin, the anterior ones rosy. Lfter, &c. Inhabits the African and Mediterranean seas.

AEOLICUM. Shell thick, with longitudinal anterior fisure, and transverse fisure behind. Chemn. &c.-A native of Guinea, and the Antilles islands. Obf. This shell is very convex, and is varied with white and redish.

OBLONGUM. Shell yellowish, oblong, turgid, and clefted; posterior part glabrous, and cordiform with a crenated margin. Chemn.-Inhabits the Mediterranean. Length three inches, breadth two inches and a half; ribs about thirty. Much allied to the following species.

CASSUM. Shell somewhat fuscos, rather oblong, thick, and antquated, with a very deeply dentated margin. Schenck, &c.-Refembls Cardium oblongum, but is much larger, rather broader, thicker, and has about twenty-three flatish ribs. Also inhabits the Mediterranean, and is found in the North Seas.

PAPYRACEUM. Shell pellucid, cinereous, with thin longitudinal fissue. Chemn.-This kind inhabits India; the shell is very brittle, within white, with purplish spots.

LATUM. Shell broad with unequal sides; ribs rather flat and spinulose. Chemn. &c.

Length two inches, breadth half an inch more; colour variable, being in some individuals white on the crown, yellowish in the middle, and edged with yellow; in others the crown is brown, and the rest of the shell banded with fuscos; inside white. Inhabits Tranquebar and Nicobar islands.

MACULATUM. Shell spotted, with crowded undulated wrinkles; ribs broad; grooves very narrow, within pale rosy. Lilt.-Found in the bay of Camppehy. This shell is nearly three inches long, its breadth rather more, being three inches and three quarters.

FLEXUOSUM. Shell rotundate, fuscos with flexuous ribs, and rugose furrows.

Described by Lifter; length one inch and three quarters, and about the same in breadth. Native place unknown.

GADITANUM. Shell rounded, yellowish-white, varied with red, green, and brown, and marked with decussated fissue. Bonan. &c. Found near Cadiz. Gmelin conceives this may be an arca.

BRASILIENSE. Shell rounded; ribs broad, flat, and very minutely crenated. Frequent on the Brazilian shores. Bonan. &c.

AMBROINESE. Shell rather oblong, white with blackish spots; the ribs very convex. - Inhabits the Amboina shores. Bonan. &c.-Obf. This shell is about an inch and three quarters in length, with about twelve ribs.

SQUAMOSUM. Shell heart-shaped, equilateral, tawny white, and purplish within; ribs with imbricated scales. Gau!. -Refembls Cardium frugans, but wants the teeth at the anterior margin. Native place unknown.

RUBINOBOUM. Shell reddish, with unequal sides, and convex ribs transversely frigated. Gau!. Native place unknown.

VIRESCENS. Shell inequalities, oblong, with very fine ribs doubled above. Gau!. Native place unknown.

FASCICATUM. Shell rounded, whitish, with a brown band; ribs acute. Knoor. Native place unknown.

CANCELLATUM. Shell reddish, thin, rounded, with decussating fissue. Gau!. Small. Native place unknown.

ALBIDUM. Shell inequalities, ribbed, whitish, and purple within.

Obf. There are a few other of the larger species of Cardium described by conchological writers which we consider as ambiguous. Thefe, with several of the more minute, and micrscopic kinds, are purposely omitted in the above enumeration of species, as we are inclined to believe the infection of such would rather tend to perplex than inform the general reader.

CARDONA, in Geography, a town in Spain, in Catalo- gia, feated on an eminence near the river Cardonerio, with a strong castle, and the title of a duchy. In its vicinity are an inexhaustible mountain of salt of various colours, which, when washed, becomes white, and also vineyards, which produce excellent wine, and lofty pine-trees. N. lat. 4° 34'. E. long. 1° 26'.

CARDONERO, a river of Spain, which runs into the Llobregat, at Manxes, in the province of Catalonia.

CARDOON, in Botany, see Cynara Cardunculus.

CARDS, playing, are little pieces of thin paste-board, of an oblong figure and of several fizes, but with us commonly 2½ inches long, and 2¼ broad; on which are printed divers prints and figures; a certain number or assemblage of which serve for the performance of various games: as baflet, ombre, picquet, whilt, &c. A full pack consists of fifty-two cards.

A pack is always wrapped up in a piece of paper, on which are printed the name, figure, dwelling-place, &c. of the maker; with the label of the flamp-office of England, signifying that the flamp-duty has been paid.

Among sharper^ divers sorts of false or fraudulent cards have been contrived; as marked cards, bref cards, corner-bend, middle-bend, &c.

Marked cards, are those where the aces, kings, queens, and knaves, are marked on the corners of the backs with spots of different number and order, either with clear water, or water tinged with pale Indian Ink, that those in the secret may distinguish them. Aces are marked with single spots on two corners opposite diagonally; kings with two spots at the fame corners; knaves with the fame number transversed, &c.

Bref cards, are those which are either longer or broader than the reft; chiefly used at whilt and picquet.

The broad cards are usually for kings, queens, knaves, and aces; the long for the reft. Their design is to direct the cutting, to enable him in the fecret to cut the cards disadvantageously to his adversary, and draw the perfon unacquainted with the fraud, to cut them favourably for the sharper. As the pack is placed either endways or sideways to him that is to cut, the long or broad cards naturally lead him
him to cut to them. Brief cards are sometimes made thus by the manufacturer; but in defect of these, sharpeners pare all but the breeches with a razor or pen-knife.

Corner-bend, denotes four cards turned down finely at one corner, to serve as a signal to cut by.

Middle-bend, or King-flour-bridge, is where the tricks are bent two different ways, which causes an opening or arch in the middle, to direct likewise the cutting.

The inventor of cards is not known, nor even the age when they first appeared; but by the matter they were always made of, viz. leaves of paper, they should seem to be much posterior to the time of Charlemagne. The hon. Daines Barrington, Mr. Bowle, and Mr. Gough, in their three essays on the "Antiquity of Card-playing." (Archeologia, vol. vii.) seem to agree that the Spaniards have the best pretensions to be considered as the original inventors of this amusemént. Others have traced their invention to about the year 1300, for the purpose of diverting the King of France, who was fallen into a melancholy disposition, and ascribe it to Jaquemin Grignon, a painter in Paris. Accordingly in the accounts of the treasurer of that prince the following article occurs: "Paid fifty fix francs of Paris to Jaquemin Grignon, the painter, for three packs of cards, gilded with gold, and painted with diverse colours and devices, to be carried to the king for his amusemént." From this article it appears, that playing cards were originally very different in their appearance and their price from what they are at present. They were gilded, and the figures were painted or illuminated, which required no little skill and genius, as well as labour: and the price of each pack was no less than 186. Sd. of Paris, a very considerable sum in those times. This last circumstance is one reason that playing cards were little known and used for several years after they were invented. By the four suits or colours, the inventor might design to represent the four states or classes of men in the kingdom. The cœurs or hearts denote the gens de cœur, choir-men or ecclesiastics. The nobility or prime military part of the kingdom, is represented by the ends or points of lance or pikes, which through ignorance of the meaning of the figure, we have called spades. By diamonds are designed the order of citizens, merchants, and tradesmen. The trefoil leaf, or clover graft, corruptly called clubs, alludes to the husbandmen and peasants. The four kings are David, Alexander, Caesar, and Charles; representing the four celebrated monarchs of the four ancient nations under Charlemagne. The Queens represent Argine (for Regina, queen by defeat), Esther, Judith, and Dalia; which are typical of birth, piety, fortitude, and wisdom. The knaves denote the servants to the knights; others apprehend that the knights themselves were denoted by these cards, because Hogier and Lahire, two names of the French cards, were famous knights at the time when they were supposed to be invented.

The first certain notice of their having been known in England occurs in a record in the time of Edward IV. On an application of the card-makers of London to parliament, A.D. 1463, an act was made against the importation of playing-cards; 3 Edw. IV. c. 4. From this statute it appears, that both card-playing and card-making were known and practised in England before this period, or about 50 years after the era of their suppotted invention. Mr. Gough observes (ubi sipra), that the use of cards among the Chinese is evident, not only from a Chineese painting which represents their ladies playing at a game with something much thicker in substance than cards, yet shaped and numbered like them, but also from a pack of Chineese cards in his possession, made of the same materials as the Europeans. However, the devices on these cards are very different from those known in this part of the world. Although card-playing was introduced at comparatively a late period in England, and the progress of it was at first slow, it at length became sufficiently rapid and extensive, to the cost of many unfortunate gamblers, and the loss of many others, who spend too muc;h of their time in this infatuating amusemént.

Lord Lyttelton in his Persian letters (and Miscellaneous works, vol. i., p. 113), admirably stales those who indulge their propensity for this kind of diversion to excess, and who risk sums of money which it is not convenient for them to lose; or, in other words, who pretend it to the purpose of gaming. Selim represents himself as sitting at a house in London, where he had a number of tables in a room, round which were placed several sets of men and women. They seemed (lays he) wonderfully intent upon some lots of painted paper, which they held in their hands. I imagined at first that they were performing some magical ceremony, and that the figures I saw traced on the lots of paper were a mystical talisman or charm. What more confirmed me in this belief was the grimaces and distortions of their countenances, much like those of our magicians in the act of conjuring; but inquiring of the gentleman who introduced me, I was told they were at play, and that this was the favourite diversion of both sexes. But, as he proceeds, I see no signs of mirth among them: if they are merry, why do not they laugh, or sing, or jump about? If I may judge of their hearts by their looks, half of these revellers are ready to hang themselves! that be may, said my friend; for very likely they are losing more than they are worth. How! said I, do you call that play? Yes, replied he, they never are thoroughly pleased unless their whole fortunes are at stake. Those cards you see them hold, are to decide whether he who is now a man of quality shall be a beggar; or another, who is now a beggar, and has but just enough to furnish out one night's play, shall be a man of quality, &c. &c.

The method of making playing cards seems to have given the first hint to the invention of printing; as appears from the first speciments of printing at Haerlem, and those in the Boulien library.

Cards, making of. The cutting of the moulds, or blocks, for these cards, is precisely the same as that used for the first books; and a sheet of wet or mofit paper is laid on the form, or block, which is first lightly brushed over with an ink, made of lamp-black mixed with flafe and water; and then rubbed off with a round Ii, in the hand. The court-cards, they colour by help of several patterns, called "tincelles," consisting of papers cut through with a penknife; within the apertures, or incisions of which, the several colours, as red, &c. are severally applied (for at the first printing, the card has only a mere outline.) These patterns are painted with oil colours, to keep them from wearing out by the brushes: being laid on the paste-board, they slide a brush full of colour loose over the pattern; which leaving the colour within the apertures, forms the face or figure of the card.

This, very probably, was the way of the first printing at Haerlem; as might have been discovered long ago, if it had been confidered, that the great letters in our old manuscripts of nine hundred years ago, are apparently done by the illuminers, after the method of card-making. By 43 G. III. c. 69, a duty is imposed of 21. 8s. on every dozen packs of playing cards imported: and for every pack of cards, made in Great Britain, the stamp duties by several acts amount to 2s. 6d., and for every pair of dice, 17s. 6d.
Places of making them are to be entered under a penalty of 5l., and forfeiture of the cards, dice, materials, and utensils. Makers of cards shall fend to the commissioners of the stamp-office a sufficient quantity of paper in order to have as many acres of paper impressed upon them as he shall desire; and a device, denoting the said acre of paper, shall be stamped on every pack used in Great Britain or intended for exportation, which device shall distinguish cards designed for home consumption from those intended for foreign consumption:—and wrappers inclosing cards for use in Great Britain shall have the name of the maker or any other particular word printed on them, according to the direction of the commissioners, who shall denote one of the 6d. duties charged on cards in Great Britain on each of such wrappers. Officers shall enter houses or places where cards and dice are made or sold, or suspected to be made, or any public gaming-houfe, to search and examine whether such cards are stamped; and the owner or occupier refusing such entrance or search shall forfeit 1s. No materials for cards or dice shall be removed till they are fitted, on pain of double duty; nor shall any cards or dice be removed, till they are duly marked or sealed, on pain of forfeiting the fame and treble value. Entry shall be made once in 28 days on oath, under a penalty of 20l., and the duties shall be cleared off once in every six weeks, on pain of double duty. Selling or using unlamped cards or dice, incurs a forfeit for each pack and for every one of such dice of 1s. with full costs. Altering the stamps subjects to a forfeiture of 20l. and the sale or purchase of such stamp incurs the same forfeiture. A person who takes off the stamp of any playing cards, or outside paper of any parcel or pack of cards, for the purpose of using it again, shall be guilty of felony, and transported for any time not exceeding seven years. The selling of wafte cards, not previously rendered unfit for use in playing, incurs a forfeiture of 20l.; and any perfon who sells any cards, as second-hand cards, in packs or parcels, the wrapper of which has been broke open, unless every card be rendered unfit for play, forfeits 5l. for each such pack. If any perfon counterfeit the stamp on cards or dice, or the wrapper, or knowingly sells the fame with a counterfeit stamp, or fraudulently uses any of the stamps provided by the commissioners, he shall be guilty of felony without benefit of clergy. No cards or dice shall be exported or exposed to sale without being stamped, until after the expiration of ten days after notice to the stamp-office by the maker of the quantity to be exported, and of the place to which they are intended to be conveyed, nor until a proper certificate be delivered to the custom-house officer at such port or place in Great Britain. Cards or dice may be removed by the maker without payment of the duties, provided the fame be stamped for exportation, and a bond be given for exporting them within the time, and landing them at the port therein mentioned. Cards for exportation shall before packing be marked as the commissioners direct; and persons using or selling such cards, marked for exportation, in Great Britain, shall forfeit 20l. for every such pack: and any perfon rebaiting any parcel of cards, entered and shipped for exportation, shall forfeit 50l. and if any perfon concerned shall inform against an accomplice, he shall be admitted as evidence, and be indemnified.

Cards, in Manufacture. See Card.

CARDUCHI, in Ancient Geography, a people of Asia, who were descended from the ancient Scythians, and divided into a great number of tribes. According to Strabo they were at a period subsequent to that of the famous retreat of Xenophon better known by the name of Parthians; a nation which became such a terror to

the Romans, M. De L'Isle, in the explication of his map of Xenophon's retreat, alleges several arguments to prove that they were the same with the present Cardi, and that their country was the same which the Romans called Carduca, a large and mountainous territory on the coast of the Tigris, and the modern Curdistan; though it is probable, that the present tract which goes by that name is of much greater extent than that which the Carduchi then possessed, who only occupied the mountainous parts of it. Before the period of the retreat of the Greeks, they had defeated a Persian army of 120,000 men, none of which ever returned, the roads being impassable. Upon the approach of Xenophon's army they betook themselves to flight with their wives and children, and gave the Greeks a favourable opportunity for supplying themselves with plenty of provisions. Xenophon was much harassed by loose bands of these people, who discharget upon them and his rear-guard which he conducted, vollies of darts and stones. The Carduchi were much superior to the Greeks in the use and strength of their bows. We are told (Diod. Sic. lib. xiv. Xenophon, Anab. lib. iv.) that they were of such prodigious length, that they bent them with their feet; the arrows were in proportion, so well tempered and keen, and darted with such violence, that no shield could repel them; so that, by being able to throw them at such a distance, they kept themselves out of the reach of their enemies.

CARDUEL, or CARThU, in Geography, a name given to the cañon part of Persian Georgia; the capital of which is Tefta.

CARDELS, in Ornithology, the name under which the common gold-finch is described by Genefer, Aldran- dus and others. See Fringilla Carduelis, Linn. Carduelis Americana of Buff is the American gold-finch of English writers; Fringilla iritis, Gmel. Carduina, in Ancient Geography. See Carduchi. Carolunculus, in Botany, Linn. ic. 2. p. 20. See Carthanaus Carduncellus. CARDUNCULUS. See Cynara.

CARDUUS, in Ancient Geography, a name given by the ancient Latin writers to several kinds of prickly plants, and particularly to the cardc, (discus fallumn) formerly used in carding wool, as it still is in dressing cloth. The word is said to be derived from caruo, (Gr. karuo) a technical verb denoting the operation of cleaning wool from its impurities. Thiffle, Linn. gen. 925. Schreb. 1254. Wild. 1433. Julf. 175. Vent. vol. ii. p. 499. Gart. 932. Chardun, La Marek Ernaye. Clafs and order, synggenof polygama equili. Nat. ord. capit. Nat. Capept. Linn. Capnepheur, Jutf.

Gen. Chal. Cal. common, swelling out in the middle, imbricated; scales numerous, lanceolate; terminated by a simple spine; in some species brown, in others white. Cer. Flores all furnished with flaments and a pifiil, uniform, tubar, funnel-shaped, nearly equal, reflexed; tube very slender; border creft, five-cleft; segments linear, equal, one more deeply serrated than the rest. Stam. Filaments five, capillary, short; anthers united, forming a hollow five-touched cylinder. Fil. Gern egg-shaped; style thread-shaped, longer than the flaments; stigma simple, awl-shaped, naked, emarginate. Peru. none; except the permanent, somewhat converging, common calyx. Seeds solitary, inwardly egg-shaped, a little four-cornered; down sullie, long, deciduous. Recep. hairy.


This genus, like most of the others in the claff syngenofia,
C _ARDUUS_.

is differently characterized by different authors. Some have divided the _Lauraeana_ genus into two: _Carduus_ including only those species which have a capillary down, and _Cirsium_ containing those whose down is feathery. Willdenow has united the latter with _Cirsium_, and makes the essential difference between _Carduus_ and _Cirsium_ to depend entirely on the nature of the down. _La Marck_, on the other hand, has abolished the _Cirsium_ of Link, which, he says, has a character too vague to be admitted; and has distributed its species between _Carduus_ and _Cirsium_, observing, that some species of _Carduus_ in the _Species Plantarum_, approach rather too near the character of _Cirsium_. After a careful consideration of the subject, we are inclined to adopt his arrangement; and have constructed accordingly the generic and specific characters of _Carduus_ given above, adding from _Garten_ "down deciduous," which has the function of _Dr. Smith_; though we are not without apprehension, that this character may not be found in all the present acknowledged species.

Species. _Leaves deciduous._

1. _C. lanceolatus._ Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Wild. 1. Gert. tab. 162. fig. 1. Monif. Bleff. 144. (Cirsium _murale_ Linnae. _C. lancifolium_.) "Leaves toothed—spines; peduncles naked, very long, one-flowered; calyxes spiny, inclined." _Root_ annual. All. Bienn. _La Marck_. _Stem_ two or three feet high. _Root-leaves_ scarcely petioled, growing close to the ground. _Stem-leaves_ smooth, bright green, spotted with white, half-bracing the stem, and running down it so as to form three uninterrupted membranous wings, oblong-egg-shaped, pinnatifid nearly to the middle; lobes furnished with spines. _Flowers_ purple, small; peduncles woolly and white, especially towards the summit, generally naked, but sometimes with a small leaf or two; _spines_ of the calyx bright, not pungent._Down_ simple. A native of Italy and the south of France.

2. _C. peregrinus._ Wild. 2. Retz. Obf. 1. p. 27. (C. _luteus_ peregrinus camerarii, _Kai_. hist. 312.) "Leaves fcoffolled, spines; down; underneath; peduncles generally naked, many-flowered; calyxes spiny, deciduous." _Root_ annual. _Stem_ three feet high, branched, fringed, smooth; terminal branches downy. _Leaves_ fcoffolled, spotted with white thorns. _Flowers_ red; _florets_ few, rarely longer than the scales of the common calyx; _peduncles_ terminal and axillary; _terminal_ ones branching, winged, long, from three to five-flowered; axillary ones short; _scales_ of the calyx a little downy, deciduous, furnished with soft spines. _Seeds_ small, white, beclouded with a whitish pellucid gum, which makes the down so strong to them, that it cannot easily be separated; down capillary. A native of Spain. _Ray_.

3. _C. lanceolatus._ Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Eng. bot. 1. 7. (C. _lanceolatus_ Wild. 10.) _Spear thistle_. "Leaves pinnatifid, hirtip; segments diversificated; calyx villous; stem hairy." _Root_ biennial, branched. _Stem_ three or four feet high, erect, strong, branched, furrowed, many-flowered. _Leaves_ alternate, woolly underneath; _lobes_ pinnatifid, or pinnate at the base; _segments_ alternately diversificated, mucronate—spiny; _spines_ yellow, shining._Flowers_ terminal, erect, large; _calyx_ egg-shaped; _scales_ acutely spiny, ascending, clothed, like the under surface of the leaves, with a white, cotton-like web; _florets_ uniform, _purple_; _petioles_ yellow. _Seeds_ ineradely egg-shaped, shining; down feathery. _Dr. Smith_. A native of white places and road sides throughout Europe, flowering from June till winter.

4. _C. nutans._ _Mulk thistle_. Linn. Sp. Pl. 3. Mart. 4. Lam. 3. Wild. 6. Eng. bot. 107. "Leaves interruptedly deciduous, spiny; _flowers_ drooping; _scales_ of the calyx lanceolate; their upper part spread-
C A R D U U S.

five depressions resembling nectarous glands. A native of
 Dutch banks and hedges, flowering in June and July. 12. C. rigo-
frentia, Lam. 16. "Leaves decurrent, narrow, fcellop-
toothed, spinous, culead; flower large, terminal." Stem
simple, scarcely a foot high, a little downy, sometimes two-
flowered. Flowers dark green, beft here and there with a
woolly down. 

Flower purple; calyx leaves three. 

C. tendiarius, Lam. 16. "Leaves decurrent, pinnatifid-
Toothed, spinous; peduncles without leaves, downy;
calyxes deciduous." Root perennial. Stem from one to
three feet high, white, with hairs. Roots leaves somewhat
lanceolate, a little fcelloped; fimu-leafes oblong, toothed.
Pubescent on both sides, white, and almost woolly un-
derneath. 

Flowers purple; peduncles short, white with 

three, neither winged nor spinous; pedicels with three or
four flowers; calyces about the fize of a hazel nut, oblong;
scapes awl shaped, creft, spreading, with small fpines; florets
often nine or ten; border creft. Linn. 18. C. angustif.
Linn. jun. Supp. 348. "Leaves decurrent, runnicate,
spinous; calyces nearly fellite, terminal." C. Arabicus,
Willd. 3. Jacq. t. 1. tab. 166. Collect. i. p. 56. "Leaves
decurrent, oblong, fcelloped, spinous, white-veined, villous
underneath; flowers fellite, rather clustered; calyces cylin-
drical." Willd. C. galatætis, Lam. 21? "Stem winged,
branched; upper wings broader; leaves decurrent, angu-
larly toothed, spinous, downy underneath; flowers fellite,
axillary and terminal." La Marc. We have transferred
the specific character given by each of the three authors,
because the identity of the plants has not been absolutely
acertained, though it seems highly probable. Professor
Marty, however, considers the arabicus and the australis as
difficult species, n. 3, and 11. Stem about a foot high,
woolly or cottony. Leaves alternate, remote, fellite, scarcely
decurrent all the way from one to another, oblong, somewhat
fcelloped at the fides, a littie cobwebbed, the lateral veins
running out into white fpines. Linn. jun. Oblong, fcel-
loped in a pinnatifid manner, toothed, spinous, attenuated
at the base, smooth, and white-veined above, woolly-villous
underneath; the root and lower fpem one petioled, the reft
decurrent. Willd. Decurrent, almost petioled, angular,
toothed, spinous, green above, white and cottony underneath.
Linn. The white veins are not mentioned by La Marc;
his specific name implies them. 

Flowers terminal and lateral, terminal ones several, lateral ones solitary, fellite.
Linn. Willd. Calyx-fceans lanceolate-egg-shaped, 

Pretfe clofe. Willd. Somewhat spreading. Linn. A native
decurrent, fcelloped, spinous, downy; calyces somewhat cylin-
drical, aggregate, fellite; scales lanceolate, rather creft." Root
annual, fpindle-shaped, small. Whole plant white, with
down. Stem four feet high, erect, stiff, but little branched,
furred. Leaves fcellopd, most woolly underneath, 

broadly decurrent. 

Flowers pale purple, terminal, cluttered, fellite; calyx slender, pale, fcarcey woolly; scales 

lanceolate, even, smooth, rather creft, but little nerved, 

acutely spinous; florets from ten to fifteen; down deci-
duous, capillary, rough. There was long much contro-

vert among British botanists concerning this thistle; the herba-

rium of Linnaeus at length determined that it has not been
infected among his works. Dr. Smith was for some time
incliued to consider C. pynceocephalus, auratis, and the
plant before us, as only varieties of the fame specific. He
oberves, however, that the two former have fewer scales in
their calyx, the falk lefs winged, and their flowers,
whether fellite or pedunculated, are much fewer together,
with lefs numerous florets. See Eng. Bot. La Marc's
acahtoides is clearly the prent plant, and he speaks of it
as very common in uncultivated ground, dry ditches, and
under the shelter of walls in France and other parts of

Europe.
CARDUUS.

Europe. In Great Britain it appears to be very local, though abundant where it has once gained a footing. It is common about London, growing, as Curtis observes, in the very inlets. We have observed it about the flots of Edinburgh and Sunderland, and should have supposed it confined to the neighbourhood of populous towns, if we had not found it in great plenty at Blackpool in Lancashire, about the dry banks, which are the only fencés of the infested land in that naked part of the country. 20. C. argenteus, Linn. Matt. 250. Mar. 10. Lam. 8. Willd. 18. Jacq. Hort. tab. 192. (Cirsium asperatum minus, foliis ad limbum argenteis.) “Leaves decurrent, roundish, spiny; peduncles somewhat downy, one-flow- ered; calyx-eggi-shaped, mucronate, not pungent.” Root annual. Stem a foot high, zig-zag, smooth, alternately branched. Leaves small, oblong, green, spotted with white, especially about the indentations. Flowers small, purple, fearfully opening, terminal; peduncles very long, one-flow- ered, downy, erect; calyx falling off entire with the ripe seeds; scales closely imbricated, erect; down capillary. Linn. and Lam. A native of Egypt. 21. C. cyanus, Linn. Sp. Pl. 9. Mar. 15. Willd. 19. 20. a. mariculosa, Gmel. f. 2. p. 43. tab. 15. B. poeipenos, tab. 16. “Leaves decurrent, pinnaflid, linear, entire, without spines, petioled, downy underneath.” Root perennial. Stem in a. nearly simple, with few leaves; in a. much branched, the upper leaves much dilated at the base, the lower ones with linear pinnae. Down capillary. Willdenow makes them distinct species. A native of Tartary. 22. C. canus, Linn. Matt. 108. Mar. 14. La Mareck 10. (Carduus tuberosus, Jacq. Vind. 280. from the description. Auft. 1. tab. 42. 43. Cirsus canus, Willd. 4. Cirsium tomen- tosum radicibus bulbofa. Bauh. hist. 3. p. 44. C. monta- num maximum, Rai. hist. p. 305.) “Leaves decurrent, white. Stem four feet high, green, angular, cobwebbed. Leaves somewhat scolloped, toothed; fringed with white, scarcely pungent spines; keeled. Flowers solitary, purple, terminal; peduncles long, with a few small floral leaves; calyx not pungent, marked with a white line on the outside. Linn. Down feathery. A native of Auffria. 23. C. pce- tinatus, Linn. Matt. 279. Mar. 15. Iam. 11. Willd. 21. “Leaves decurrent, lanceolate, pinnaflid pectinate; pedun- cles very long; flowers drooping as the seed ripens.” Root biennial. Whole plant smooth. Stem two feet high, erect. Leaves with a pale keel, deeply toothed, so as to resemble a comb; teeth equal, lanceolate, large, entire, but lightly ciliated; ending in a flat spine, furnished at their base with a small delind tooth. Flowers purple, the fize of the common cardonk, toothed; peduncles very long, one-flow- ered, somewhat downy; calyx-alaes linear, spreading; anthors white; pili long. Linn. Raised by Limmus from seeds brought among other kinds from Pennsylvania. 24. C. alpnyx, Willd. 23. Wahlit. and Kitaib. pl. rar. Hung. “Leaves semi-decurrent, pinnaflid, acuminate; segments two-lobed, ciliated-spinos; peduncles downy; calyx-alaes linear-awl-shaped, spreading.” Stem a foot, or a foot and half high, simple. Leaves on both sides. Flowers pur- ple, two or three at the tip of the stem; peduncles leafless, downy. Down capillary, rough. A native of the Croatian Alps. 25. C. defloratus, Linn. Sp. Pl. 21. Mar. 16. Lam. 12. Willd. 24. Jacq. Auft. tab. 89. Hall. helv. 677. tab. 18. fig. 2. “Leaves decurrent, lanceolate, ferrated, somewhat ciliated with spines, smooth; peduncles very long, woolly, one-flow- ered.” Root perennial. Whole plant smooth. Stem sometimes simple, only a foot high, one-flow-er; sometimes branched, a foot and half high. Leaves dark green; peduncles leafless, a little cottony towards the summit. Flowers purple, often drooping at the base upwards. Down capillary. A native of Auffria, Switzerland, and the northern provinces of France. 26. C. femininus, Willd. 27. “Leaves semi-decurrent, ferrated, spiny, grey underneath; peduncles very long, one flowered, woolly.” Similar to preceding, but its leaves are shorter, grey underneath, and leaf deeply ferrated; the calyx-alaes spreading. A native of the northern part of Peru. 27. C. medius, Lam. 13. Gouan. Illust. 62. tab. 24. Mar. 43. excluding the reference to Allioni pedem. (Cicus Gouani, Willd. 6.) “Leaves decurrent, pinnaflid, spiny at their edges; stem one-flow- ered; calyx-alaes without spines, spreading, bristle-shaped.” Similar to C. defloratus, but its leaves are villous underneath, larger and more divided. Root perennial. Stem a foot and half high, simple. A native of the Pyrenees. 28. C. carlinef- bus, Lam. 14. Willd. 8. Vahl. Symb. i. p. 157. “Leaves decurrent, smooth on both sides, pinnatifid; pinna angularly cut, spiny; peduncles one-flowered, woolly under the flower.” Lam. Stem a foot and half high, erect, branched, smooth, spiny, woolly near the summit. Leaves resembling those of the preceding species in shape, but smooth on both sides; spines strong, yellowish. Flowers purple, seldom more than three; calyx-alaes lanceolate-awl-shaped, spreading, rather pungent. Vahl. A native of the south of France. 29. C. carlinef- bus, Willd. 42. Mar. 7. Gouan Illust. 62. tab. 23. (Cirisus pyrenaeus, Linn. 1 Carduus tomentosus pyrenaeus, Thouin. fult. 441.) “Leaves decurrent, pinnaflid, downy; segments palmate, spiny; flowers chaffered.” Vahl. Root perennial. Stem a foot high, or more, white with down, sometimes panicell-branched; branches axillary, alternate, solitary. Root-leaves three or four inches long, somewhat lanceolate, petiolate, woolly; pinnules on each side from twelve to fifteen, imbricated, three or five-Leaf, the lobes alternately smaller, end- ing in a strong yellow spine. Stem-leaves crowded, very like those of the root, but as they approach the top of the stem the pinnules are narrower and less palmaroted. Flowers purple, from four to eight; peduncles short, woolly; calyx in flowering time very smooth, green, acuminate-egg- shaped; scales loosely imbricated, but not quinquefollo, nearly equal, a little pungent; the inner ones somewhat violet-purple, more slender, flexible and soft. Gouan. A native of the Pyrenees, and of the Alps about Col Tende. La Mareck believes it to be the cardina pyrenaeus of Linnzeus. 30. C. argemone, Lam. 15. “Leaves decurrent, broadly egg-shaped, twice pinnaflid, ciliated, smooth on both sides; peduncle terminal, one-flow- ered.” Lam. Stem about a foot high, simple, smooth. Leaves ciliated, with very small spines. Calyx smooth; scales close, not pungent. Described from a single specimen in the herbarium of Thouin, brought from the Pyrenees by abbé Pourret. 31. C. montifruitifolius, Linn. Sp. Pl. 16. Mar. 17. Lam. 17. Gouan. Monsp. 422. (Cirus Monsp. Willd. 9. Cirsium folius non hierifus, Sanguis compactus, Bauh. pin. 577.) “Leaves decurrent, lanceolate, somewhat repand, or a little scolloped, smooth, unequally ciliated; peduncles alternate; calyxes not pungent.” Linn. Root perennial. Stem four feet high, channelled, a little branched, greenish below, slightly cottony towards the summit. Leaves almost entire, a little glaucous, the lower ones entirely decurrent, middle ones semi-decurrent, upper ones feathery. Flowers purple, remarkably small for the size of the plant; calyx-alaes small, expanding at the points. Down feathery. A native of the south- west of France. 32. C. pyrenaeus, Lam. 18. Mar. 45.? Jacq. obs. 4. p. 11. tab. 95. Gouan. Illust. 63. (Cirsium pyrena- eum.)
CULUS

Circaus pyreus, Lam. 55. "Leaves decurrent, lanceolate, a little repand, downy underneath, ciliate-spinous; flowers clustered." Lam. Perhaps only a variety of the preceding: it is, however, larger, and confinely distingished by its leaves being cottony and whitish underneath, by the long, yellow-white, pungent spines with which the leaves are ciliated, and by its clustered flowers at the top of the stem. The root-leaves are more than a foot long, narrowing into a petiole. Lam. A native of the Pyrenees. We are in doubt whether the pyreneni of professor Martyn be the same plant. His only synonyms are Jacq. obl. 4. 11. Ger. Prog. 179. n. 13. and J. & Linn. pedem. n. 140, tab. 1. neither of which are quoted either by La Marek or Willdenow. His specific character accords sufficiently with La Marek's, except in deferring the leaves as downy on both sides; but his larger description taken from Allioni does not seem to be consistent with it. It is as follows. Stem three feet high, or more, fribated, green, smooth. Leaves alternately felifi, and decurrent with ears; almost winged, or very deeply gashed, with few teeth, ending in a longer spine; the whole edge ciliate with short spines. Flowers at the top, three or four, with a small leaf under each; peduncles cobwebbed. Top of the stem almost naked; calyx-feales not pungent, linear, reflected at the end. This description agrees better with C. pratensis of La Marek, which is certainly not the pratensis of the English botanists; but there are some differences, as will appear from the following description. 33. C. ambiguus. (C. pratensis, Lam. 25. C. pratensis aphiodeli radices, folis profunde et teniiter lacinia. Baul. pin. 377.) "Leaves semi-decurrent, pinnatifid-laciniate, ciliated, smooth on both sides; flowers generally foliary, pedunculated." Root perennial. Stem three or four feet high, litfled, a little branched. Leaves smooth, and green on both sides; spines not pungent; root leaves long, pinnatifid; pinnules cut into deep segments; lower leaves leaves cut in the same manner, and at least semi-decurrent; upper ones smaller, less divided, less decurrent, many of them fible. Flowers purple, resembling those of C. monspeliensis. A native of the south of France, described by La Marek from a living plant. La Marek observes that it may possibly be C. tubulosus of Linnaeus, but not all his synonyms. 34. C. chinus, Mart. 20. Jacq. Hort. 3. tab. 5. "Lower leaves semi-decurrent, fespinnatifid, ciliate-spinous: upper ones embracing the stem or fible; stem not fipous; peduncles one-flowered." Nearly allied to the preceding, if it be more than a variety. Stem five or six feet high, branched from top to bottom, angular, viscid, erect. Leaves lanceolate-oblong; the upper surface fribate smooth, and deep green; the lower somewhat villous, and paler, but no where woolly; acuminate and pinnatifid; segments lanceolate, ciliate-spinous, fercally pungent; root-leaves a foot and half long. Flowers purplish fial-colour, erect; peduncles terminal on each branch. one-flowered, near the flower a little woolly, and suffrilled; calyx egg-shaped, not fiform; scales with an oblong, glinmate bump on the back, ending in a short, dark, dark purple spine. Seeds fribine: down feathery. A native of China, received by Jacquin about the year 1779, from Marefig of Pads. 35. C. creticus, Lam. 20. (Cirrus creticus athis, Lam. 20. (Cirrus cireticum officinale, C. lanceolati-folio. Tour. Cor. 32.) "Leaves decurrent, pinnatifid, smooth underneath; segments diversifid, spinous; flowers small, clustered; calyx scales small, somewhat fipous." Stem a little branched near the fumity, spinous, fribated, almost smooth. Flowers resembling those of C. lanceolatus, but narrower. Flowers purple; calyx globular. A native of the Isle of Candia, described by La Marek from a dried specimen in the herba-
bottom. 

Leave lanceolate-lanceolate, two or three inches long, green and smooth above, except at the base, a little rolled back on the sides; throat of the former year remaining withered and dry at the bottom of the stem. 

Flowers purple, terminal; calyx egg-shaped, contracted at the top, glaucous green; scales simple, stiffish, acute but not pungent; anthers purple, each terminating at the bottom in two curv. filaments very hairy at the top. 

Seed egg-shaped, grey; down very long. 

A native of the Upper Calabria, gathered in 1783 by Angelo Fusani. Before that, it was known to exist only in the Herbarium of Ferrarisi Imperiai, under the name of Jacca. 42. C. dollatus, Linn. Sp. Pl. 13. Mart. 24. Lam. 26. 

Foliis integris, floribus purpureis, Toon. 420. (Cnicus dollatus, Willd. 42.) 

"Leaves sessile, linear-lanceolate, entire, not pungent, downy underneath; axillary spines in pairs, somewhat branched; flowers fiddle, lateral, and terminal." In habit resembling Centaurea calcitrapa. 

Root annual. 

Stem a foot high, much branched, a little corymbose. 

Leaves three inches long, green above, very narrow at the base. 

Flowers purple, solitary; peduncles with two or three floral bracts; calyces scales lanceolate-sharp, pungent. 

A native of Sicily and the country of Nice. 43. C. dentatus. 

(Cnicus dentatus, Willd. 11.) 

"Leaves embracing the stem, lanceolate, doubly toothed, spinous, woolly underneath; stem one-flowered; calyx scales lanceolate-egg-shaped, mucronate, prepelled close." 

Stem half a foot high or more, simple, erect, furnished, especially near the flower. 

Leaves on the stem generally four; lower ones somewhat petiolate; upper ones embracing the stem, narrowed at the base. 


Rai Sup. 179.) 

"Leaves sessile, lanceolate, edged with spiny teeth, downy underneath; stem leafy, one-flowered; calyx not pungent." 

Linn. "Calyx-scales mucronate." 

Wildl. Stem slender, a foot or eighteen inches high, furnished with 26 or 28 leaves, which diminish in size from the bottom to the top. 


Thum. Jap. 305. 

"Leaves sessile, linear, ciliate-spinous, smooth; flowers terminal, solitary." 

Stem a foot high, herbaceous, erect, round, brassed, not pungent; branches alternate, spreading, a little downy near the top. 

Leaves two inches long, spreading. 

Flowers small; calyx a little downy at the base. 

A native of Japan. 46. C. giganteus, Desf. Atl. 2. p. 245. tab. 221. 

C. lebar. Foyr. im. 2. p. 201. (Cnicus giganteus, Willd. 19.) 

"Leaves embracing the stem, egg-shaped, falcate, kid with slightly hairy, downy underneath; lobes spinous; peduncles about three-flowered; calyxes globular; scales lanceolate, spinous, prepelled close. 

A native of Algiers. 47. C. lanatus. (Cnicus lanatus, Willd. 21.) 

"Leaves falcate, lanceolate, falcate, falcate, smooth, downy underneath, spiny at the edges; calyx oblong; scales egg-shaped, mucronate, recurved." 

Stem erect, falcate, smooth, branched. 

Leaves two inches long. 

Peduncles naked, one-flowered, pubescent. 


(C. maculis albis exotica, Bahm. pin. 381. 

C. latifolius echinos oblongis purpureis hermis, Bahm. pin. 380. C. luteus syriacus, Cam. Hort. 35. tab. 10. 

Cnicus syriacus, Willd. 45.) "Leaves embracing the stem, oblong, toothed, spinous, white-veined; flowers nearly sessile, bracteated; calyx-scales oblong-lanceolate, prepelled close, mucronate." 

Wildl. Root annual. 

Stem two or three feet high, erect, simple, almost smooth. 

Leaves angularly falcate, green, spotted with white; lower ones 

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what toothed, ciliate, woolly underneath; stem nearly naked, one-flowered; calyx villous." Root perennial, creeping; fibres long, staple, fleshy. Stem erect, about a foot and half high, simple, seldom more than one-flowered, rounded, narrow, woolly. Leaves unequally toothed, sometimes a little scolopaded, ciliate with stronger and more purplish spines than those of C. heterophyllus, roughish, ciliate beneath, but not fleshy white; root-leaves three or four, pinnate; stem-leaves two or three, smaller, remote, embracing the stem. Flower purple, terminal, at first nodding, afterwards erect; peduncle a little thickened at the top, fleshy white; sepals lanceolate, erect, ending in a weakish spine; down as in C. heterophyllus. A native of myrtle places in France and England. We are informed by Dr. Smith, (Eng. Bot.) that Linnaeus took up his distichous from books, without having it in his herbarium. All his synonyms are said by La Maree to belong to the present plant, species having been sent him from the neighbourhood of Olenus, which perfectly agree with Lobel's figure. It seems, therefore, probable that he accidentally prefixed an erroneous specific character to his synonym, and that his differences has no specific existence. 54. C. ferrugineus, Linn. Sp. Pl. Mart. 32. (Castr. Meth. Nat. 199. (Jacq. Ind. Nat. 199. and tab. 1. 257.) (Cucumis ferrugineus, Willd. 26.) "Leaves embracing the stem, lanceolate, entire; flowers ferrugineus, bracteate, peduncles one-flowered." Linm. "Leaves filiform, lanceolate, remotely serrate, ciliate, with small spines, green on both sides; calyxes not pungent, oblong, convex; down fleshy, very long." Linn. According to Linnaeus it differs from C. helenoides in its smaller, scarcely narrowed stem, and narrower leaves, with the floral ones lanceolate, not asp-flowered. Willdenow adds that in this species the stem is branched, and the leaves green on both sides. La Maree affirms, that his ferrugineus resembles his helenoides (which, however, is heterophyllus), in nothing but the generic character. It appears, nevertheless, from his description, that there are many points of resemblance, and that his plant is probably the ferrugineus of Linnaeus, as we think it certainly is that of Willdenow and Jacquin, though Jacquin says the stem is simple when wild, and branched only when cultivated. A native of Siberia, Switzerland, and Austria. 55. C. tartaricus, Linn. Sp. Pl. 23. Mart. 33. Linn. "Leaves embracing the stem, lanceolate; sepals fimbriatus, awn-flowered; flowers with two leaves." Linm. "Leaves embracing the stem, oblong-lanceolate, toothed, ciliate, purplish, peduncles one-flowered; calyxes bracted; scales lanceolate, spinous. Wild. Habit and size of the preceding. Linn. Root perennial. Stem a foot and a half high, smooth, sometimes simple, and sometimes with a branch or two, each bearing a single flower. Leaves little scolopaded, toothed, smooth on both sides; root-leaves long, petiolate; stem-leaves rather distant. Flower yellowish white; bracts generally three, small, lanceolate, ciliate. La Maree. Calyx-scalles with a white keel. Linn. A native of Siberia and the Alps. 56. C. poirundifolius, Mart. 41. (Cucumis carnicolius, Wildl. 33. C. oldianus, Scop. Carn. 1009. tab. 51.) "Leaves heart-shaped, embracing the stem, oblong-egg-shaped, toothed, ciliate; root-leaves oblong, obtuse, scolopaded, ciliated; flowers terminal, somewhat clustered; calyxes involucrate; scales lanceolate, spinous. Wild. Root perennial. Stem hairy. Root-leaves petiolate, hairy on both sides; petals hairy. Flowers yellowish white; calyx involucrate, with three lanceolate ciliate leaves. Wildl. 57. C. angustifolius, Linn. 54. "Leaves sessile, long, narrow; toothed, ciliate; flower involucrate by about five linear bracts. Stem near two feet high, a little branched, and somewhat woolly. Leaves green, smooth on both sides, opposite, others alternate. Flowers solitary, terminal. Cultivated in the royal garden at Paris, and said to be a native of the Alps. 58. C. carnicolius, Linn. 32. (Cucumis carnicolius, Willd. 33. C. carnicolius, Scop. Carn. 1009. tab. 51.) "Leaves embracing the stem, long, pinnatifid; pinnules parallel, ciliate-spinous; bracts ciliate, entire, rather coloured, covering the flowers." Nearly allied to the three preceding. Root perennial. Stem sericeous, smooth, weak. Leaves large, dilated, pale green; lower ones narrowing into the petiole. Flowers yellowish white, terminal, clustered; bracts ciliate. A native of meadows in many parts of Europe. 59. C. poirundifolius, Willd. 34. Walsh. and Kew. P. Rar. Hung. "Leaves embracing the stem, egg-shaped, somewhat fimbriate, ciliate, serrated, root-leaves fimbriate; flowers yellowish; calyx-scales lanceolate, the lower ones spreading. Root biennial. Stem naked toward the top, with or without clustered, terminal flowers. Leaves pinnate beneath; root-leaves a foot long, oblong-rounded, a little scolopaded. A native of Hungary. 60. C. ferreolus, Willd. 35. Vill. Delphi in. p. 12. tab. 19. (Cucumis antarcticus, Wildl. 36. "Leaves heart-shaped, embracing the stem, pinnatifid, lanceolate at the top, ciliate-spinous, rather woolly underneath; flowers clustered; calyx-scales lanceolate egg-shaped, mucronate, spreading at the tip." Root perennial. Leaves dilated at the base, pinnatifid and toothed in the middle, elongated, and lanceolate at the end. Flowers white, terminal. 61. C. ferrugineus, Lam. 41. "Leaves embracing the stem, entire at the base, pinnatifid-peckinate towards the top, green on both sides; branch-leaves very entire; flowers rather clustered, terminal." Root perennial. Stem two or three feet high, more or less branched. Leaves divided in their upper part into lanceolate segments resembling the teeth of a comb, each ending in a spine. Flowers two or three together, pale or yellowish, acquiring a purple tint from the colour of the anthers; calyx smooth, not pungent. Cultivated in the royal garden at Paris, supposed to have been brought from Tartary. 62. C. montanus, Willd. 37. Vill. and Kitaib. Pl. Rar. Hung. "Leaves embracing the stem, pinnatifid, rugged, spinous-ciliate; segments alternate, oblong-lanceolate three-nerved; stem branched; flowers clustered; calyx-scales egg-shaped, spreading at the tip. Root perennial. Flowers purple. A native of dry mountains in Croatia. 63. C. rivularis, Mart. 38. (C. rivularis, Willd. 35.) "Leaves toothed, ciliate, naked, embracing the stem; root and lower stem leaves pinnatifid; flowers clustered, capitulate; calyx-scales lanceolate-egg-shaped, pre-fused clove." Wildl. Root perennial. Stem usually single, two or three feet high, erect, round, hollow, a little villous, angular at the bottom, ciliate at the top, with a few dilated bracts; generally quite single but sometimes with short, one-flowered, axillary branches; sometimes, especially towards the top, covered with a white wool; ending either in a single flower, or a few collected into a head, rarely fix or seven, and in that case the lower ones are produced. Leaves somewhat villous, deeper green above, whitish underneath; root ones lanceolate, narrowing into the petiole. Flowers purple; calyx egg-shaped, somewhat glabrous, but not villous; leaves lanceolate-acuminated, not pungent, outer ones dark green, inner ones dark purple and gradually longer; down somewhat flattered. A native of Austria and Hungary. Profeilor Martyn has quoted Scopoli n. 1025. tab. 54. under both C. carnicolius and C. rivularis, adding to the latter a reference to Jacquin, and by referring from one to the other, seems to think they may possibly
C A R D U S.

Possibly be the Lance plant. He has neathew all given diff

tinct descriptions of each, of the forms from Scopoli, and
of the latter from Jacquin, which do not very well accord
with each other. Willdenow, who had shewn specimens of
both, has kept them separate. 67. C. salsugineus, (Culcins
suitugineus; Willd. 29.) "Leaves twirled, ciliated; leaf-leaves
embracing the stem, pinnatifid, root
ones undivided, oblong; stem twilled; calyces ciliate, pedicled clole." 

Root perennial. Stem hairy. 

Leaves smooth, befit with very few, feathery hairs. A 

native of moat meadows about Salzburg. 65. C. annuus, 


4. p. 204. tab. 16. (Culcins tidgen; Villid. 28. Ciriun. 

Hall. n. 176.) "Leaves oblong- lanceolate, <nitous, spii-

rons at the edges, pinnatifid; segments oblongly lobed.

calyces oblong, bracteated." Martyn supposes it to be the

name with C. muticoxis of Villars, fee n. 57. A native of

Switzerland. 69. C. Alliurn, (Culcins medius; Willd. Cirun.

median. Allion ped. n. 542. tab. 49.) "Leaves

sehile, pinnatifid; segments generally three-echt, ciliate-

spinous; item branched, calyces naked; seles, egg-lanceo-

late, mucronate, pedicel clole." Root perennial. Perfectly 

distinct from C. medus of Gunne (nee n. 275) which has

been quoted as a synonym, notwithstanding it has decer-

rent leaves. Willd. from a living plant. 67. C. radulae, 

Villid. 29. "Leaves pectinate-pinnatifid, naked, rugged;

segments linear, not purgent. terminal one egg shaped; upper

leaves sessile; calyces-leafed sharped, mucronate; inner

ones elongated, linear, colored." Root perennial. Stem

branched, many-leaved. Leaves green on both sides; lower

ones petioloed. Flowers violet. Donn. capitally. 

A native of calcareous mountains in Hungary. 68. C. leucphi-

Lam. 29. Villars delph. 3. p. 33. tab. 10. "Leaves

egg-shaped, pinnatifid-toothed, at the base, serrated; after

underneath upper ones sessile; item one-leaved; calyces-

leafed egg-shaped, not purgent." Similar in habit to the pre-

ceding. Root perennial. A native of mountains in Dauphiny.

69. C. nitidus, Wildl. 32. Waldit. and Rital. pl. 

rar. Hung. 1. p. 52. tab. 52. "Leaves not purgent; root-

leaves egg-shaped, toothed, cut at the base; item-leaves

pinatifid-linear; item one-leaved; calyces-leafed egg-shaped,

mucronate." Root perennial. Upper leaves entire, linear-lan-

celolate. A native of calcareous mountains in Hungary.


and Autl. tab. 60. (Culcins crisitbelus; Linn. Sp. Pl. 4. 

Wildl. 37. Ciriun acanthoides montana, flore flavicente: 

Tour. Illust. 448.) "Lower leaves petioloed, egg shaped, 

deeply pinnatifid; pinnules parallel, three-nerved; peduncles

naked, one-leaved." Root perennial. Stem 

a foot and half high, generally ample, nearly smooth. 

Leaves nearly smooth, greenish; lower leaves near together, toothed,

spinos ciliated; upper ones embracing the item, dilated, 

narrow. Flowers yellowish white, terminal, nodding. A 

native of France and other temperate parts of Europe. 71. 

C. tricaflus, Lam. 35. (Ciriun; Hall. helv. n. 175. 

Cardus-ciriun maximum profunde laciniam. Pluk. tab. 

154. fig. 2.) "Leaves embracing the stem, pinnatifid, 

ferrated, ciliated; flowers ferrile, about three, cluftrated at 

the top of the item." Root perennial. Stem two or 

three feet high, ample, a little cotty under the flowers. 

Lower leaves petioloed, egg-shaped, a little cut or doubly

toothed, green and smooth above, with short hairs on their

hindmost nerves; upper leaves embracing the item, deeply 
pinnatifid; pinnules parallel, narrow, ciliated. Flowers 
purple; calyces smooth, not pungent. A native of Auvergne 

and Dauphiny. La Marc observes, that this and the pre-

ceding have been confounded by Linneus and Haller. 72. 

C. oholoucus, Mart. 44. (Culcins oholoucus; Willd. 38. 

Culcium; Hall. helv. n. 245. Hall. helv. n. 174.) "Leaves 

and stem, the item, densely pinnatifid, dilat-

ated, pinnules lanceolate, these serrated, uppermost con-

ferrate; peduncles ferrated; calyces lanceolate, mucro-

nate. Stem pungent. Flowers yellowish orange. A 

native of Switzerland and Savoy. 73. C. Lactiflora, Lam. 

37. "Leaves embracing the stem, pinnatifid, mucronate, 

pinnatifid, grey underneath; flowers about leaves, clufтратed 
at the top of the item; terminal one crad." Stem a foot 

and half high, simply, abundantly leafy, cotty in its upper

part. Leaves appressed, green and leathert above, white, 

cottony underneath, pinnules half dark yellow; 

pinnules narrow, curved upwards, ending in a weak spine. 

Flowers large, purple; calyces smooth, not pungent. A 

native of the Alps about Grenoble. 75. C. caesiufos, 

Lam. 53. "Leaves embracing the stem, pinnatifid; 

pinnules laciniate upwards." Stem two feet high or more, 

cottontowards the top. Leaves green and dark leathet above, 

lightly villous and pale underneath, yellowish; 

root leaves large, petioloed; item ones smaller, 

embracing the item. Flowers large, with which a red tint from 

the colour of the anthers, partly clustered several together at 

the top of the item, partly solitary, peduncled, in the axil 

of the upper leaves; calyces smooth, not pungent. Cultu-

rated in the royal garden at Paris, and said to be a native 


Lam. 39. (Culcins althienuus; Wildl. 29. Ciriun ammifolius; 

Dit. Est. 81. tab. 69. fig. 30.) "Leaves sessile, pinnatifid, 

scollaped, ferrated, not purgent; item much branched;

calyces villous, somewhat ferrated." Root perennial. Stem 

ten or twelve feet high. Leaves green above, cottony and 

white underneath. Flowers purpulc, single at the top 

of each branch; calyx woody; bractes several, narrow, 
toothed, forming an involucreum. 75. C. bulbifusa, Lam. 

44. (Culcins bulbifusa, Monspeliense, flore flavifloro: cu-

bilibrums, folis Lacinios, J. Bauh. 3. p. 43. C. bul-

bulbifusa monspeliense; Lab. le. n. 10. Ciriun, 

Hall helv. n. 177.) "Stem naked above, with one or two 

flowers; leaves deeply pinnatifid; pinnules cut, 

lobed, ciliated, ending in a small spine; flowers solitary. 

Root composed of several bulbs or tubers. Stem a toot 

and half or two feet high, slender, furtated, cottony, espcri-

arily near the top, with two or three leaves on its lower part. 

Leaves almost all petioloed, greenish above, and beftit with 

short, thinly ciliated hairs, cottony and white underneath. 

Flowers purpure, rather small terminal; scales egg-shaped, 

mucronate, not purgent. A native of Germany, Switzerland,

and the South of France. There is a variety in the 

neighbourhood of Paris, with leaves almost entirely green. 

La March observes that Linneus was probably unacquainted 

with this plant, having erroneously referred Lobel's C. bulbifusa 

to his tuberosus from which it is perfectly distinct, its 

leaves not being decurrent. He conceives that the tuber-

osas of Linneus may possibly be the plant which he has de-

scribed under the name of pratensis, and which we o a co-

nt of the uncertainty have called ambiguus, (fee n. 23) 

pratensis as a specific name being pre-occupied. 77. C. 

laciniatus, Lam. 45. (Jacae scelleta f. tubulosa; Palhern. i. 

154. "Stem leafy, branched, leaves deeply pinnatifid, 

green on both sides; pinnules laciniated, spinos ciliated, 

peduncles one flowered." Distinguish from the preceding.

Its leaves are not decurrent; it therefore is not the tuberos-

uses of Linneus. Stem a foot and half high, smooth, chan-

nelled. Leaves large, somewhat petioloed. Flowers large, 
purple or white, peduncled; calyces not purgent. Described 

from a dried specimen in the herbierium of Justell and sup-

posed to be a native of the Alp. 78. C. arvensis, Lam. 


1842. p. 851.
Eng., 1755. C. ferratula arenaria, Linn. Sp. Pl. Mut. Wildd. Carduus vulgarifolius var. mam. (Rai syn. 1754.) Creeping or way thistle. "Leaves sessile, pinnatifid, spiny; , metal pinnate, calyxes egg-shaped, slightly spiny; down featherly. Root perennial, creeping, tapering, descending deep into the ground, not easily extripated. Stem three feet high, erect, round, smooth, many-flowered. Leaves slightly decurrent, alternate, smooth, lobes unequal, ciliated, spiny. Flowers purple, rarely white; calyx egg-shaped; scales broad-lanceolate, preped close, woolly at the edges, with a short, spreading spine; down deciduous, root permanent as in C. arenaria. Dr. Smith. A native of most parts of Europe. 79. C. dio- color, (Cnicus diofrorum, Wildd. 189.) "Leaves sessile, pinnatifid, hairy, downy underneath; pin- nules two-lobed, divaricated, spiny; calyxes globular, cobwebbed, pubescent, fleshy egg-shaped, preped close, ending in a spreading spine." Root biennial. A native of North America. 80. C. orientalis, (Cnicus orientalis; Wildd. 17.) "Leaves sessile, pinnatifid, smooth, downy underneath; pinnules lanceolate, spiny; calyxes egg- shaped; scales preped close; outer ones awl-shaped, inner ones lanceolate." Stem downy. Leaves narrow, downy on the midrib above, snow-white underneath; pinnules with a spine at the tip, and at the upper part of the base. Calyx only half the size of that of C. lanceolatus. A native of the Eaa. 81. C. cyanoides, Linn. 28. (C. cnicus folius lanceolatus, Tourn. Cor. 31. Cnicus cyanoides; Wildd. 16.) "Leaves sessile, obovate, pinnatifid, downy underneath; pinnules angular, divaricat ed, spiny; flower large, terminal." Stem erect, flinted, cottony. Leaves smooth, and shining above, very white underneath. Flower purple; calyx-cales lanceolate, pungent; outer ones reflexed, and widely spreading. A native of the isle of Canda. 82. C. ciliatus, Hort. New. 3, p. 144. Murray Com. Goett. 1784, p. 35, tab. 5. (Cnicus ciliatus; Wildd. 12.) "Leaves embracing the stem, hispid, pinnatifid; pinnules two-lobed, divaricated, spiny, downy underneath; calyxes egg-shaped, scales lanceolate, spiny, ciliated, reflexed." Root perennial. Stem many from the same root, five or six feet high, hairy, round, with prominent lines, and horizontal white hairs, branched on the upper part; branches about a foot long, compound, alternate, ac- eeding; branches three, short, zig-zag. Stem-leaves a few, about half long, ferning each other. Stem-leaves about a foot long, half embracing the stem, horizontal, al- ternate, rough, and green above, with fleshy coloured veins, which end in waved-awned fimbriae of the same colour. Flowers terminal, solitary, yellowish white; calyx cylindric, oblong, broader at the base; scales yellow, linear, preped close, end- ing in a weak spine. Seed top-shaped, four-cornered; down abundant, feathery. A native of Siberia. 83. C. leucocephalus. (Cnicus leucocephalus; Wildd. 13. Cdition creticum altaesium C. lanceolato foli flore albo; Tourn. Cor. 32.) "Stem-leaves sessile, pinnatifid, hispid, downy underneath; pinnules lanceolate, spiny at the tip; calyxes cylin- drical, alternate, villous, involuted, scales oblong, preped close, ending in recurved spines." Wildd. Root-leaves pectolored; pinnules lanceolate, two-lobed, divaricated, ciliated at the edges, spiny at the tip; pinnules of the stem-leaves undivided, revolute at the edges; with a strong, yellow spine at the tip, at the bottom of each indument. Flowers alternate, axillary, on short peduncles; involucrum of three or five leaves. A native of Crete. 84. C. echinatus, Def. fan. atl. 2, p. 247. (Cnicus echinatus, Wildd. 14.) "Leaves sessile, pinnatifid, hispid, woolly underneath; pinnules two-lobed, divaricated, spiny; calyxes egg-shaped, woolly, bracteated; scales awl-shaped, spiny, preped close." Stem a foot high, erect, firm, twined, woolly; branches erect, forming a kind of corymb, one-flowered. Leaves resemb ling those of C. lanceolatus; hispid above, with numerous short, yellowish hairs, repand-pinnatifid; lobes remote, ending in a long yellowish spine, solitary or in pairs, one larger. Flowers a second part longer than those of C. lanceolatus; peduncles leafy, fringed, woolly; bracts narrow-lanceolate, surrounding the calyx; calyx egg-shaped, woolly; scales closely imbricated, spiny and lobe at the tip. Desf. A native of Barbary. 85. C. ericifolius, Linn. Sp. Pl. 16. Mart. 27. Lam. 29. Eng. bot. 350. (Cnicus ericifolius, Wildd. 15.) Fryars crown. Fryars thistle. Woolly headed thistle. "Leaves sessile, pinnatifid, to two ranks, spiny, rough; pinnules alternate, erect; calyces globular, woolly." Root biennial. Stem three or four feet high, erect, round, twined, smooth, many-flowered, much branched; branches spreading. Leaves spreading, alternate, deeply pinnatifid with two ranks of oblong divaricated segments, which point alternately up- wards and downwards, armed with strong spines, rough above with small rigid, close-prefixed bristles, woolly under-neath. Flowers purple, or white, large, terminal, solitary, erect; peduncle leafy; calyx globular, or somewhat de- predd, scales linear, numerous, spreading, beautifully cob- webbed, tipped with a leafy appendage, coloured, ciliated, smooth, micraceous-spiny; down feathery, deciduous. A native of England and most parts of Europe, on a calcareous soil. 86. C. ferox, Lam. 30. (Cnicus ferox; Linn. Mart. 72. Mart. 2. Wildd. 11.) C. lanceolatus valdivianus acu- las, Tourn. Inft. 450. Carduus tomentosus. Label. ic. 2, p. 111. "Leaves sessile, pinnatifid; pinnules lanceolate, dilated; flowers large; bracts linear, very spiny." La Mark observes that this plant is so far from being of a different genus from the preceding, as Linnæus makes it, that it is fearcelly a distinct species. Root biennial. Stem not so high as that of C. ericifolius. Leaves sessile, or a little embracing the stem, not decurrent as represented by Linnæus, greenish, and rough with numerous spines above, a little cottony, and whitish underneath. Flowers large, pur- ple; bracts ending in a strong spine, rough at their edges and over their whole surface, with a great number of very sharp spines. A native of the nouth of France. 87. C. spinifolium, (Carduus comolius, Lam. 31. Cnicus spinifollis, Linn. Sp. Pl. 3, Mart. 6. Wild. 48. Carduus poly- cephalon, Lam. 380. Circuitum, Hall. h. 172. tab. 32.) "Leaves embracing the stem, lanceolate, pinnatifid, spiny; stem simple; flowers whorled, clustered at the top among numerous leaves." 88. "Heads of flowers naked, without spines." Stem a foot and half high, furrowed. Leaves near the flowers cloves flet, pubescent, yellowish, with long sharp spines. Flowers yellowish white; calyx-scales smooth, ending in a long spine. A native of the Alps. If 88. be not, as Haller thinks it, a distinct species, it is a very remarkable variety. Lam. 38. C. echinocephalus. (Cnicus echino- cephalus; Wildd. 40.) "Leaves sessile, rigid, deeply pin- japifid, downy underneath; pinnules linear, spiny at the tip; calyxes globular, smooth; scales lanceolate, spines, spreading." Root perennial. Stem from four to six inches high, fimple, erect, down. Leaves alternate, crowded; pinnules entire, dilatant. Flowers solitary, terminal, or on short branches from the axils of the upper leaves; calyx- scales purple. A native of Tauria. De Beer. 89. C. aculeus, Linn. Sp. Pl. 26. Mart. 38. Lam. 49. Eng. bot. 101. (Cnicus aculeus, Wildd. 40.) Dwarf thistle. "Stem- leas; calyx smooth." Root perennial, woody, blackish. Leaves defrizzed, spreading in a radiate manner, and cov- ering a space often not less than a foot in diameter, petioled, smooth, pinnatifid; pinnules somewhat palmated, spiny. Flowers purple, large, generally solitary, almost sessile; calyx
CARDUUS.
calyx egg-shaped; seeds lanceolate, scarcely keeled; somewhat ciliate at the tip, slightly spinous. The nature of gravi-
velo and chalky palustris in many parts of Europe, not a
usual English plant, but abundant in Norfolk, where it
is the pest of the sheep down. When cultivated in a garden,
and sometimes when wild on a rich soil, a stem is produced
bearing several flowers; it is then the C. dubius of several
German botanists. 90. C. inermis, (Cnicius inermis, Willd.
22.) "Leaves pinnatifid, lanceolate, glossy, toothed, downy
underneath; root leaves pinnatifid; calyx-sectes egg-lanceo-
late, membranous at the edge, pricked close."
Root perennial. Stem crowded, green, slightly villous. Root-leaves a
foot long, or more, deeply pinnatifid, toothed; lower lem-
anes five or six inches long, attenuated at the base, acu-
minate at the tip, pinnatifid in the middle; upper ones un-
divided, attenuated both ways, toothed. Flower solitary,
terminal, very large; calyx-leaves, as well as the whole
plant, without spines. Native country unknown. 91. C.
pinatifida, Cavan. l.c. 1. p. 58. tab. 83. (Cnicius pinati-
fidus, Willd. 47.) "Leaves petioled, oblong, pinnatifid,
toothed, woolly; calyx-cylindrical, terminal, teeth pricked
close, oblong, cartilaginous, mucronate; tips spreading.
Root annual. Stem four or five inches high; simple, erect,
downy. Leaves egg-shaped, somewhat lyrate, without
spines, clothed on both sides with a fine wool; midrib and
veins downy. Flower solitary. A native of Spain. 92. C.
7. Willd. 50. Centaurnum majus, folius circinnatur; Morif.
lii. 3. p. 131. tab. 25. fig. 2.) "Leaves pinnatifid; calyx-sectes acu-
satile; roots acuminate." Root perennial. Leaves without spines. A native of the Pyrenees and of Si-
beria; Georg. k. t. 1. p. 229. 93. C. hirtifolium, (Cnicius,
Linn. Mutt. 572. Mart. 8. Willd. 51. Centaurna cylae-
bus membranaceus. Gmel. Sb. 2. p. 86. tab. 38.) Root
perennial. Stem two feet high, crept, somewhat angular,
feebly woolly, one-flowered. Leaves numerous, feebly,
without spines; greyish; pinnules alternate; upper leaves
smaller, more nearly entire; root leaves petioled; segments
lanceolate, serrated. Flower violet, terminal, feebly;
calyx large, globular; scales loose, egg-shaped, villous, grey;
florets fix-felt; segments linear, acute; flumes white,
longer than the corolla; style longer than the filaments,
thread-shaped, violet. Willd. A native of Siberia. 94. C.
cartho漫aides, (Cnicius cartho漫oides, Willd. 52.) "Leaves
without spines, feebly, oblong, toothed; root-leaves some
undivided, others pinnatifid; calyx-feebly, villos."
Root perennial. Stem erect, round, thick, frutished. Flower purple,
large, terminal, foliaceous; calyx-sectes roundish-egg-
shaped. Willd. A native of Siberia. 95. C. terramos, (C.
ceratium, Linn. Sp. Pl. 6. Willd. 53. Mart. 9. Cardus,
Gmel. lib. 2. p. 27. tab. 19.) "Leaves embracing the
item, egg-shaped, toothed; root-leaves heart-shaped; pe-
tioloed, winged, spinospinothoed; calyx feebly, gen-
tally solitary, corolling; terminal; root perennial." A native
intertupique pinnatis; Gouan illus. p. 63. Cirium, Jacq.
vind. 276. subf. tab. 13. Spop. Cam. 4. 1800.) "Leaves
pinnatifid, linear, revolute at the edge, downy; stem nearly
naked, one-flowered, calyx-sectes downy, egg-lanceo-
late, squarrose." Willd. Root perennial. A native of Austria,
and the south of France. La Marek affirms that the pla-
st of Clivus and of Gouan are perfectly distinct, and that both
of them are filiferous species of Serratula. We have no
doubts whether our fix preceding ones do not properly be-
long to that genus, their calyx-sectes not appearing truly
spinos in the moat lax skull of the term; but as Willdow
has placed them under his Cnicius, of which a spinos calyx-
seft enters into the essential character, we have not thought
fit to remove them. In the membranous, cartilagineous or
squamous edges and terminations of their calyx-sectes,
they may be thought to approach those species of Car-
thus which have leaffy appendages to those sectes. That is
still more the case with C. eriophorus. But as a compound
spine, or more than one to each scale, forms the essential ge-
eric character of Carduus, as Le Marek has determined it,
they cannot be placed under that genus. Le Marek's
definition, indeed, is altogether artificial; and it would
perhaps be more conducive to scientific accuracy and per-
ciseness if Carduus as well as Cnicius were incorporated
with Carduus. The genus would not be much larger;
and it might easily be divided into well-defined sections,
if we had thought that the form of our work authorized us
to innovate such a change, and have relieved us
from the necessity, to which we have reluctantly
submitted, of no longer calling the well known marianus a
cardus. But all the liberty that we allow ourselves is to
execute our own judgment when authors differ, and to fol-
low those who appear to us to have most clearly followed
the rules of nature.

Of the propagation and culture of plants of this genus,
little is to be said. In their wild state, the Author of nature
has made abundant provision for their increase, by
annexing to their seeds a light, and often feathering them,
which makes them readily lost in the air, and scatters them far
and wide over all the neighbouring fields. As they are sus-
ceptibly considered rather in the light of noxious weeds than of
ornamental plants, few of them are admitted into the flower-
garden or greenhouse; and those few are valued more for
their rarity than for their beauty. Some of them, how-
ever, if it were not for the general prejudice against them,
might with advantage be sparingly introduced into the bor-
ders of the pleasure ground. Of the native English species,
the erioporus, the heterophylos, and the nutans are the
most striking. The first two have the additional recom-
dendation of being not common; and we should suppose
that every one who spends any part of the summer months at Bus-
ton, must think the close ranks of the last which line the sides
of all the stone walls, a real ornament to that naked country.

By the farmer the whole tribe is held in abhorrence, and
marked for destruction. The annual and biennial kinds are
easily got rid of by cutting them down with a weeding hook
in corn fields, and moving them in pastures before they ripen
their seeds. But those that are perennial can be extirpated
only by plowing the fields, and carefully gathering the roots.
Of these, the most tormenting to the English farmer is the
arvensis, which on account of its creeping root that strikes
depth into the ground, has been called by Curtis the cursed
thistle. Thistles in general, it cannot be denied, make part
of the curle pronounced upon the ground at the original fall
of man from his native innocence. "Curled is the ground for
thy sake: thorns and thistles shall be thine until thou return
unto the ground." In what manner the human race would have
lived if they had never learned, we are not able to determine;
and as we have no experience to afford us in our inquiries,
it would be folly to attempt to guess. But of this we are
sure, that with their present feelings and habits, they
cannot attain even to a moderate degree of happiness unless
they engage in some kind of useful labour. A blessing has
therefore, been graciously intermingled with the curse. To
fail in it is an advantage, for which he ought to be
highly thankful, that he is obliged to cultivate the earth for
the comfortable support of his life, and that no part of the
produce of the ground is spontaneously raised to that state
of excellence which is most conducing to his enjoyment.
Let
Let no one then presume to assert that thistles are made in vain, even though it should be allowed that they have no other use than to prevent a considerable part of mankind, either from the intolerable little fleas of doing nothing, or from the painful confusions of having done mischief. On this supposition, they are not without a final cause, in which the wisdom and the goodness of the adored Creator are equally conspicuous.

But in the works of God there is always a manifest use. Limnæus has observed, that the carduus lanceolatus protects by its spines the annual plants which have grown themselves in its neighbourhood, and give them an opportunity of maturing their seeds without disturbance. Dr. Withering adds, that if a heap of clay be thrown upon it, nothing would grow upon it for several years if the seeds of this plant were not wafted to it by the wind, which vegetate and afford shelter for other plants, so that the whole becomes fertile. The truth of the latter observation we are rather inclined to doubt. But supposing it to have little or no foundation in fact, the pious philosophical mind will readily perceive other valuable purposes in the general economy of nature, to which this despised and hated race of vegetables are subservient. The seeds afford sustenance to several kinds of birds, which either serve to replenish our tables, or delight us with the melody of their notes, the beauty of their plumage, and the elegance of their flight. The leaves are eaten by various insects, which though they do not appear immediately useful to man, may, for ought we know, be important links in the great chain of creation, on which the welfare of the whole depends. Or, if they be not either immediately or remotely useful to man, who will presume to think that infinite benevolence do not create distinct ranks of beings, merely for the sake of giving them capacities and means of enjoyment, and of adding to the general mals of happiness which is bountifully diffused through the universe?

Carduus marianus, Linn. See Carduus angustifolius. See Dipsacus fullonum.

Carduus foliis glosseis ad infeas juniperi, Moris. See Dipsacus fullonum.

Carduus brahii, foliis albis, Bauh. pin. See Brodiaea cacumin.

Carduus acantha l. brunæ næs, Bauh. hiß. See Acanthus mollis, or smooth Acanthus. See Acanthus mollis, or smooth-leaved Acanthus.

Carduus perforatus, Jacq. Autt. tab. 248. Willd. i. 33. See Acanthus perforatus, where we have described it. But as its calyx-spines, though reflexed, are not hooked, it is properly a carduus.

Carduus incurvus, Hall. helv. n. 165. Capitalis in vertice congesta, fœnunmis reflexis, Gmel. Sib. 2. tab. 24. See Acalyphiæ coronata.

Carduus caule ramoso, Gmel. Sib. 2. n. 38. tab. 17. See Acalyphiæ coronata.

Carduus pratensis latifolius, Bauh. pin. 375. Lob. ic. 2. p. II. See Carduus oleraceus.

Carduus carduus erectus, Moris. hift. 3. tab. 34. fig. 10. See Carduus tingitanus.

Carduus chamissonis, Moris. hift. 3. tab. 53. fig. 17. See Carduus corymbosus.

Carduus serotinoides, Baii Sup. 199. See Xeranthemum prostratum.


Carduus pharaccophthalmus, Bauh. pin. See Echinops.

Carduus foliis lutescentibus, Lob. ic. 2. 17. See Dipsacus fullonum.

CARDWANG, CAFE, in Geography, a cape on the N. coast of the island of Java. S. lat. 5° 35'. E. long. 107° 10'.

CARDY, or CARGY, two small rocks on the eastern coast of Ireland, about two cables’ length E. of Newhaven point, and near a mile north of Ballbriggen, in the county of Dublin, which are dry about half ebb. N. lat. 53° 38'. W. long. 6° 11'.

CARDYMUS, in Ancient Geography, a mountain of Asia, near the Tigris, and probably not far from Niphis.

CARDYTHENES, a people of Asia, in Syria, inhabiting the small territory called Cyrcottica, according to Pliny.

CARE, a place of Spain, between Liminium and Saragolla. Anton. Impt.

CAREARA, in Geography, a town of Persia, in the province of Segelana; 8 miles N. of Kin.

CARECARDAMA, in Ancient Geography, a town of India, on this side of the Gangis. Ptolomy.

CAREDIVA, in Geography, an island of the Indian Ocean, on the western side of the island of Ceylon.

CAREERING, a term, in the Sea Language, used for the laying of a vessel on one side, to caulk, ship up, or trim the other side.

The word comes from career, which signifies the fame, formed of the Latin curare, the heat of a fish.

A ship is said to be brought to a careen, when the greatest part of her hasting, &c. being taken out, and a pontoon, or another vessel lower than herself, laid by her side, she is hauled down to it as low as occasion requires, and there kept, by the weight of ballast, ordnance, &c. as well as by ropes, lest it should strain her masts too much. This is done with design to trim her sides, or bottom, to caulk her seams, or to mend any fault she has under water. Hence, when a ship lies on one side in sailing, she is said to sail on the areen.

Ships of war are generally careened every three years.

The half careen is when they can only careen half the ship, not being able to reach so low as the bottom of the keel.

CAREER, or CAREER, in the Mares, a place inclosed with a barrier, wherein they run the rings.

The word is also used for the race, or course of the horse itse., provided it does not exceed 200 pace.

In the ancient circus, the career was the space which the bigger, or quadrige, were to run at full speed, to gain the prize. See Circus.
CARES, in Geography, is a town of PimIENT, in the province of Lérida; 6 miles N.W. of Lérida.

CAREBALI, a province of Eastern Finland, is now the government of Viborg; which lies. This country became a part of Sweden in 1293; in 1338 part of it was surrendered to Russia; and in 1721 the greater part of the remainder was given up to the empire.

CAREMA, a town of Piedmont, in the marquisate of Ivrea; 8 miles N.W. of Ivrea.

CAREMBOUE, a town of the island of Madagascar, near the south coast. N. lat. 25° 20'. W. long. 84° 1'.

CARENAGE Bay, a bay on the west coast of the island of St. Lucia. N. lat. 1° 37'. W. long. 60° 50'.

CARENE town. See St. George.

CARENI, in Ancient Geography, a people mentioned by Pline, and placed in the northern part of the isle of Albion, or in the north-western part of Scotland. They are also called Carini. They seem to have dwelt about Lochbay, on the N.W. coast of Ross-shire. Camden places them in Crainifie.

CARENI, a people of Asia, towards Perse; placed by Steph. Byz. between the rivers Cyrus and Ephrates. Procopius says that these people offered to Cofroz money to avoid being pillaged; but that he refused it, because they were not Christians.

CARENNAC, in Geography, a town of France, in the department of the Lot and Garonne, seated on the Dorodognne; 24 leagues N.W. of St. Céré.

CARENTAN, a town of France, in the department of the Channel, and chief place of a canton in the district of St. Lo, situated in a marshy soil, which makes the air infulibrious. It has a port for small vessels; its principal commerce consists of butter and cattle. The place contains 2857, and the canton 11,951 inhabitants; the territory comprehends 182.4 square kilometres and 15 communes. N. lat. 49° 18'. W. long. 1° 21'. 50'.

CARENTIA, or Garentia, in Ancient Geography, a town of Italy, belonging to the Libici, placed by Clever towards the confines of the Scyliotes and the Padus.

CARENTOIR, in Geography, a town of France, in the department of Morbihan, and chief place of a canton in the district of Vannes; the place contains 5110, and the canton 71,249 inhabitants; the territory includes 200 square kilometres and 7 communes.

CARETOMAGUS, in Ancient Geography, a place of Gaul, in Aquitania Prima, E. of Divona (Calhors), and W. of Segodunum (Rhodes).

CAREUVE, in Geography, a town of the island of Celyon; 54 miles N.W. of Trincomalee.

CAREOT, in Ancient Geography, a people of European Sarmatia. Prolemy.

CAREPULA, a town of Africa, placed by Prolemy in Mauritania Cufarienis.

CARERA, in Geography, a small trading place between Culture on the coast of Coromandel, and Montipolie, or Great Poli, 31 leagues N. and N.E. by N. from it.

CARE, in Ancient Geography, a town of Spain, in the territory called Tarragonenis. Phioy.

CARES, or CARE, in Geography, a town of European Turkey, seated on mount Athos, in an elevated and pleasant situation; it has several convents, and a market every Saturday, for corn and other provisions; 17 miles S.E. of Salamis.
CAREW, Thomas, an English poet of the 17th century, belonged to the family of the Carew in Gloucestershire, which originally descended from that of Devonshire. Having been educated in the university of Oxford, and farther improved himself by travelling, he was honourably received at court, and much respected for his polite and elegant accomplishments. Charles I. appointed him gentleman of the privy chamber, and fever in ordinary; and by Ben Jonson, Sir William Davenant, and other poets of that period, his abilities and performances were extravagantly admired and applauded. It redounds, however, much more to his praise, that he was intimate in his youth with the great earl of Clarendon, who speaks highly of his amiable qualities, and of his talents for light poetry of the amorous kind, in the elegance and fancy of which he had few equals. From him also we learn, that Carew, after passing 50 years of his life in a careless and licentious manner, died (about the year 1659) with sentiments of penitential remorse and unfeigned respect for Christianity. He left behind him several poems, which have been frequently reprinted, and a masque, entitled, "Caelum Britannicum." Biog. Brit.

CAREW, Richard, was a defendant of the Cornish branch of the Carew family, and born in 1553. After spending three years in the university of Oxford, and about the same time in the Middle Temple, he travelled into foreign parts; and upon his return settled in his native county. The only original work written by him, if we except "The true and ready way to learn the Latin tongue," which is ascribed to him, was his "Survey of Cornwall," published in 4to. at London, in 1603. This work, which is much commended by Camden, has been since in a great degree superceded by Dr. Borel's excellent publications relative to the county of Cornwall. Mr. Carew was held in high estimation for his talents and learning by several of the most eminent scholars of his time; and particularly by Sir Henry Spelman, who extols him for his ingenuity, virtue, and learning. He died in 1620. Biog. Brit.

CAREW, George, brother of the preceding, was educated at Oxford, studied the law in the inns of court, and then travelled to foreign countries. On his return, he was called to the bar, and enjoyed some posts of honour and profit. Queen Elizabeth conferred upon him the honour of knighthood; and he was employed at home in treating with the Scotch concerning an union between the two kingdoms, and abroad in foreign embassies, first to Poland and afterwards to France. During his residence in the latter country, he formed an acquaintance with several literary persons, and particularly with Thuanus, to whom he communicated hints relating to Poland, which were of use to that excellent author in compiling part of his history. After his return from his French embassy in 1609, he drew up, for the use of James I., a periphrastic "Relation of the State of France, with the Characters of Henry IV. and the principal persons of that Court," which valuable tract was communicated, in MS., by the earl of Hardwicke, to Dr. Birch, who published it in 1749, at the close of his "Historical View of the Negotiations between the Courts of England, France, and Brabant, from the year 1502 to 1617." This intelligent writer commends it as a model upon which ambassadors may form and digest their notions and representations; and Mr. Gray also represents it as an excellent performance. From a letter written by Thuanus to Camden,

who heard him at every period of his fame, were his greatest panegyrics.

CAREUS, in Ancient Geography, a town of Asia, in the country called Caricena. It was separated from the Grannus to the north-west by a small chain of mountains. Sabro.

CAREY, in Geography, a town of Germany, in the Territory of 35 miles S.W. of Balzana.

CAREY, a small bay in the gulf of Darien, which has two islands before it that are moderately high, and covered with trees.

CAREY, in Grammar, a character in this form (a) denoting that there is something inserted or interlined, which should regularly have come in where the character is placed. This mark is also called a circumflex, when placed over one vowel of a word, to denote a long syllable; as "Euphrates."

CAREY, in Zoology, synonymous with Caretta, which sec.

CARETTA, in Geography, a small low island, about 4 of a league from the main, lying on the coast of Peru, in the Southern Pacific Ocean, 3 leagues from the cape of Cangaln, or St. Gallan.

CARETTA, in Zoology. See Testudo caretta. Caretta is sometimes applied to the species Testudo imbricata, Kuorr, &c.


CAREW, George, in Biography, earl of Totnes, the defendant of an ancient family in the west of England, which came over probably from France with William the Conqueror, and originally derived this name from Carewcastle, in Pembrokehire, was born in 1557. At the age of 15 he was admitted a gentleman-commoner in the university of Oxford, where he made a good proficiency in learning, particularly in the study of antiquities; but being inclined to a military life, he went to Ireland, and served against the earl of Desmond. Having successively occupied several important posts, and commanded abroad in the expedition against Cadiz, in 1596, he was appointed president of Munster, in 1599, and in the following year treasurer of the army, and one of the lords-justices of Ireland. When he was advanced to the office of governor, he found the country in a state of open rebellion; and yet by his prudence and valour he succeeded, with a small force, in reducing it to the queen's obedience, and in counteracting the hostile designs of the Spaniards, who landed at Kinsale, in 1601. Having settled the province in a firm and universal peace, he obtained permission to resign his office in the beginning of the year 1603; and arrived in England three days before Queen Elizabeth's death. Upon the accession of King James he was particularly noticed, and advanced to several posts of honour, and, in 1605, created a baron, by the title of Lord Carew of Clifton in Warwickshire, as he had married the daughter and heiress of William Clifton, Esq. When the crown devolved on Charles I., he was created, in 1625, Earl of Totnes. Having established the character of a faithful subject, a wise and valiant commander, an honest councillor, a good scholar, and a patron of learning, heclofed his life at the Savoy, in London, in 1629, and was buried at Stratford-upon-Avon, near Clifton, whence he took his first title. After his death his natural son, Thomas Stafford, published, in 1633, a work written under his direction, and entitled "Pacata Hibernia," or The History of the Wars in Ireland, particularly within the Province of Munster, during the years of his Government, fol. illustrated with 17 maps. In the Bodleian library are also four large volumes of chronologies, charts, &c. relating to Ireland, which were collected by Sir George Carew; and his materials for writing "The History of the Reign of King Henry V." are inserted in Speed's Chronicle. Biog. Brit.

CAREW, Thomas, an English poet of the 17th century, belonged to the family of the Carew in Gloucestershire, which originally descended from that of Devonshire. Having been educated in the university of Oxford, and farther improved himself by travelling, he was honourably received at court, and much respected for his polite and elegant accomplishments. Charles I. appointed him gentleman of the privy chamber, and fever in ordinary; and by Ben Jonson, Sir William Davenant, and other poets of that period, his abilities and performances were extravagantly admired and applauded. It redounds, however, much more to his praise, that he was intimate in his youth with the great earl of Clarendon, who speaks highly of his amiable qualities, and of his talents for light poetry of the amorous kind, in the elegance and fancy of which he had few equals. From him also we learn, that Carew, after passing 50 years of his life in a careless and licentious manner, died (about the year 1659) with sentiments of penitential remorse and unfeigned respect for Christianity. He left behind him several poems, which have been frequently reprinted, and a masque, entitled, "Caelum Britannicum." Biog. Brit.
in the spring of the year 1671, it appears that he was then lately deceased. Bong. Brit.

*CAREX*. in Botany, (derivation uncertain, supposed by some from the Greek verb, name, tend, afford, in allusion to the sharp edges of the triangular flank, and apposite to the character given of it by Virgil,


Gen. Char. Flowers disposed in one or more oblong, imbricated carins; the male and female in some species on the same, in others on distinct carins. Male. Cal. glume one-valved. one-flowered, lineolate, acute, concave, permanent. Cy. none. Stam. filaments three, biied, shaped, erect, longer than the calyx; anthers exed, long, linear. Female Cal. none. Car. petals none; ovary inflated, oblong-egg-shaped, contracted upwards, opening at the tip, sometimes with two teeth, permanent. Flo. germ three-fidled, within the ovary; style simple; stigmas either three or two, awl-shaped, incurved, long, acuminate, pubescent. Petiole none, except the enlarged nectary which protects the seed. Seeds fingle, acutely egg-shaped, mostly frequently three-fidled, one angle often less than the other.

Eff. Char. Seed included in the permanent nectary.

An admirable monograph of the British species has been published by the Rev. Dr. Goodenough, in the Transactions of the Linnean Society, of which we have gratefully availed ourselves. Mr. Wahlenberg, of Upsal, has also written an excellent monograph of the genus published in "Kongl. Vetenskaps Academiens Nya Handlingar Fir Aprili, Majas Janus, 1852," and republished in the fourth number of the Annals of Botany. We have made our arrangement, and drawn up the article before this work fell into our hands, but have since infilled all his new species, with fresh additions to the others as seemed important. From him we have also borrowed the references to the coloured figures, published by Mr. Schkuhr of Wittenberg.

Of the earlier modern botanists Linnæus appears to be nearly the only one who retained the term carex, and used it in its ancient acceptation. It was not employed either by Tournefort or Ray. Tournefort united several species under the vague appellation of cyperoidæ; one or two of which, if rightly understood, have both male and female flowers on the same spike; but his generic character comprehends those only which have in them separate spikes. Ray has adopted a still more exceptionable name, gramine cyperides; and has been justly accused by Dr. Goodenough of including cyperus under it, and thus "making the thing likened include and refer itself for its original;" but in justice to our great countryman it ought to be added, that though in the introduction to the genus, as it stands in his Synopsis, he has, perhaps, inadvertently made cyperus one of the divisions of his gramin cyperides, in the subsequent nomenclature of species he has carefully kept them distinct. We may observe, by the way, that this impropriety is of frequent occurrence in the writings of Jaffœau and other French botanists.

About the beginning of the last century, Micheli and some others applied the term carex to those species, which have male and female flowers on the same spike, calling the other, egg-shaped cyperides or spicoidæ. Linnæus extended it to both, and formed the preceding generic character, to which, as to its substance, all subsequent authors have acceded. Dr. Goodenough, indeed, doubts whether the two families may not be advantageously again divided; but with due deference to this excellent naturalist, whose name must always carry with it a great weight of authority, as Linnæus's generic character is clear and definite, and especially as the two families sometimes run a little one into the other, it is surely more conducive to scientific precision to keep them together; and the ease of the investigating student is quite as well consulted, by making these subdivisions of one large genus.

A great diversity of opinions has prevailed with respect to the proper appellation of this part, which Linnæus has called the nectary. Tournefort calls it a vehicle, which afterwards becomes a capsule. Ray does not appear to have noticed it. Linnæus himself, when he speaks of it in an advanced state, sometimes calls it a tube; but more generally, though in defiance of his own definition, a capsule. Germer, in the first volume of his great work, "de floribus et feminis plantarum," calls it a conspicuous nut, formed of the indurated corolla, observing that it is not a true pericarp, but a mere involution of the seed, since it permits the pupil to pass freely through it, which is contrary to the nature of a pericarp. If this eminent botanist had lived to publish a second edition of his work, he would probably have called it an angium. See the preface to the second volume, p. 32. La Mare, regarding only the form, calls it, not unjustly, though not very scientifically, an urceole. Dr. Smith, in several parts of his English botany, has expressed an inclination to consider this puzzling appendage to a very simple flower, as a true permanent corolla, which gradually hardens, and finally becomes an envelope of the ripened seed; but afterwards, in consequence of suggestion from Dr. Goodenough, supported by his own deliberate judgment, was induced to call it an aril, "as a name much better expressing its true nature than the hypothetical one of nectary, the erroneous one of capsule, or even the analogical denomination of corolla." As such it is described in his Flora Britannica. See also the fifth volume of the Transactions of the Linnean Society, p. 265. It may be proper to add, that in the third volume of the same Transactions there is a paper by Dr. Goodenough, in which he intimates a belief, that all carices displace their seeds by the opening of the point of what he there calls the capsule; and as this opening is observed in some very early, and in others not till they are quite old, in the former case it has been described as opening, and in the latter as quite closed. In a very recent number of the English botany, Dr. Smith still continues to call it a cunic, a term which as it leaves the matter ad hoc judicis, we shall employ in the following descriptions, in all cases where we do not use the more general term, fruit.

In dividing the genus into sections, Linnæus separated those which have stigmas from those which have peduncled female spikes. Dr. Goodenough observes, that this has been a source of great perplexity; for cultivation, or in a natural state a luxurious growth, does away the whole distinction. The peduncle, moreover, is often or in a great degree concealed by the sheath of the foliaceous bracte. Thus C. diffis always has its spikes on long peduncules, but as they are embraced by the sheaths, Linnæus placed them nearly stigmas. Dr. Goodenough has therefore proposed a new mark of distinction, founded on the proportion which the peduncle bears to the sheath, and where in the same under every variation of foil and cultivation. If the sheath be of twice the same length as the peduncle, he calls it virginæ equans; if half the length, divisiadi; if about a quarter, abbreviata. 

Species
Species. * Spike simple, simple.


* Fruit lanceolate-triangular, not egg-shaped, not gibbous, beaked, more strongly ribbed, and on both sides, rough near the tip at the angles, membranous and entire at the orifice, finally spreading in a deflexed direction, acuminate, so as to render the spike squarrose; ligmas two. Sent to Dr. Smith and Dr. Goodenough from Switzerland by Mr. Davall; discovered in Mearnshire by professor James Beattie jun. of Aberdeen, and on Landfowl-hill near Bath by Mr. Grouet and Mr. Lambert. 3. C. capitata, Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Flor. dan. 372. Wahlen. 2. Schkuhr 2. tab. Y. fig. 80. "Spike simple, egg-shaped, bearing both male and female flowers, the male ones above, fruit neither ferrated nor rough at the edges, scarcely nerved, imbricated, spreading." * Root perennial. * Glumes scarcely green at the back. Linn. "Spike somewhat globular, male flowers at the top; ligmas two; fruit circinate-ovate, a little convex on one side, flat on the other, quite smooth and even, slender, obtuse at the edges; leaves filiform." Wahlen. A native of Lapland, but not of Great Britain, as Linneus supposed. 4. C. leptoclada, Wahlen. 3. (Po-lytrichoides; Willd. MSS.) "Spike with few and rather scattered flowers; ligmas two; fruit oblong-elliptical, enarginate; leaves very narrow." A native of North America. 5. C. polycarpos, Linn. Sp. Pl. 3. Mart. 3. Lam. 3. Leers tab. 14. fig. 1. Flor. dan. 166. Eng. bot. 1051. Schkuhr 3. tab. A. fig. 3. (C. pylllophora; Linn. jun. Supp. 413. Ehr. Phyt. n. 7. Wahlen. 4. C. minima, cap-fulis deorum deflexa; Mich. gen. 65. tab. 33. fig. 1.) "Spike simple, with both male and female flowers; upper ones male; fruit divericuated, reflexed, tapering at both ends; ligmas two." * Root perennial, fibrous, not creeping as in C. dioica. * Stems often a foot high, simple, slender, smooth, leafy near the base. * Leaves bristle-shaped, in tufts, rigid, smooth, channelled, nerve, nearly as long as the stems. * Spike linear, erect, at first refimbelling that of C. dioica, in which state it is figured in Flora danica. * Male flowers, numerous; glumes brown, finally preloded close; female holessly imbricated, finally reflexed; glumes deciduous, being forced off by the bending back of the open germ. * Fruit elliptical-lanceolate, sharp-edged on each side, finely cloven at the tip; stigmas slender, two, obtuse, flowing, reflexing, forming a spike not resembling that of a fleu, whence the trivial name; ligmas two. * Seed elliptical brown. A native of marshy ground in England and other parts of Europe, flowering in June. 6. C. obtusa, Wahlen. 5. Liljeblad Act. Stockh. 1793. tab. 4. "Spike of about four flowers; ligmas three; fruit inversely egg-shaped, inclining to globular, somewhat conic, patent-diverging; orifice transparent, two-lobed; leaves very narrow." A native of Sweden in dry gravelly soil. 7. C. petraea. Wahlen. 6. "Spike with numerous male flowers at the top, three scattered female ones at the base; ligmas three; glumes somewhat circinate, large, very brittle; fruit top-shaped, very ten, erect; stem acutely angular. A native of rocky mountains in the north of Lapland. 8. C. pyrenica. Wahlen. 7. "Spike many-flowered, dense; female flowers numerous; ligmas three; fruit narrow-oblong, with a short, beak, diverging." A native of the Pyrenees. 9. C. poaceiflora, Mart. 45. Light-foot Flor. Scot. tab. 6. fig. 2. Smith Flor. Brit. n. 4. Schkuhr 4. tab. A. fig. 4. (C. pratula;鹤uff. 402 and 657. C. lennoeboechn; Linn. jun. Supp. 413. Ehr. Phyt. n. 8. Mart. 55. Wahlen. 8.) "Spike simple, with few flowers; fruit spreading, awl-shaped; ligmas three." * Root perennial, creeping. * Stems from three to five inches high, spreading, smooth, obscurely triangular. * Leaves generally two, even, channelled, about half the length of the stem. * Spike loose; flowers from four to six; terminal; one of them male, erect; the rest female, spreading, finally bent down. * Fruit somewhat triangular, furrowed; ligmas three. According to Lightfoot there are sometimes only two. A rather rare native of alpine marshes in Scotland, flowering in June. * In the north of Sweden common. 10. C. squar-roya, Linn. Sp. Pl. 4. Mart. 4. Lam. 4. "Spike simple, with male and female flowers, cylindrical; lower flowers male; fruit imbricated, horizontal." * Spike thick. * Fruit with a long linear beak. One of the largest species in the genus. Linn. A native of Canada, Kalm. 11. C. hirta, Mart. 46. Wahlen. 10. Swartz. Prod. 18. (C. uncinata; Schkuhr 7. tab. G. fig. 30. C. polycarpo; Cavallis Icon. vol. p. 151. tab. 464; fig. 1.) "Spike rather long, male flowers at the top; ligmas three; glumes oval, as long as the fruit, obvolute; fruit oblong, obtuse, convex on one side, a little concave on the other, ciliated, with a long and hooked awn." Wahlen. A native of mountains in Jamaica; Swartz. Chili, Cav. Isle of France. Grondal. 12. C. uncinata, Linn. jun. Supp. Mart. 5. and 53. Lam. 6. Wahlen. 11. "Spike very long, thickened above; male flowers at the top, ligmas three; glumes adnate, oblong, short; fruit oblong, with a short and roundish beak, and a rather long, hooked awn." Wahlen. The most beautiful species in the genus. * Female flowers occupying two thirds of the spike;awn curved above the middle, thickened at the joint. Small spikellets sometimes hang down at the side, which are perhaps barren. Linn. jun. A native of New Zealand. Forlil. 13. C. cri-

15. C. Bellardi. Mart. 48. Wahlen. 15. Allion. Ped. 2395. tab. 92. fig. 2. Schkuhr 25. tab. D and H. fig. 17. (C. myriofolia; Villars Dauph. 2. 104. tab. 6?) " Spike somewhat compound, linear; spikelets of two flowers, upper one male; lower female, with three gligms; glumes somewhat crenulate, large, very brittle; fruit top-shaped, flanged; stem round; leaves filiform." Wahlen. * Root fibrous. Stamens numerous, about seven inches high, filiform, somewhat curved. Leaves convoluted, filiform, somewhat curved, about the height of the stem. Spike about an inch long; flowers generally solitary, alternate, sessile; so that the spike seems to be interrupted; glumes egg-shaped, acute, without awn, bay with a whitish edge. Allion. A native of Piedmont. Although these two authors do not exactly agree in their manner of describing the inflorescence, the difference seems to be only verbal. The myriofusus of Villars, which he supposes to be the same plant, and which he says has hermaphrodite flowers and half naked seeds, must be distinct, and if his description be exact, is a Carex. 16. C. capnoides. Wahlen. 14. Thumb. * Spikelets male at the top, somewhat compound, near together; gligms three; fruit oblong, acute, convex on both sides, obtusely angular, a little curved outwards, broad somewhat foliaceous, leaf round. 17. C. cyperoides. Linn. jun. Suppl. 413. Mart. 6. and 54. Lam. 5. Wahlen. 33. Schkuhr 28. tab. A. fig. 2. (C. bohemicum, Schreb. grami. tab. 28. fig. 3. Mich. gen. p. 76. tab. 33. fig. 19. Cyperus minor, capitatis inflatus; Buch. Cent. 4. p. 34. tab. 61. Scirpus pica multipartita. femininus cordatis; Gymn. ibid. v. 1. p. 81.) " Head terminal, roundish; flowers absolutely simple, also, filiform, involucres long. Fvrescens absolutely filiform, (which is angular), pedicellate, forming a little umbel, Linn. jun. La Marck adopts all the younger Linnaeus's synonyms; but gives the following description, which appears to be taken from Schreber, resembling Cyperus in its general habit and involucre, and Scirpus in the disposition of its flowers. Root perennial. Stems about a foot high, triangular, sheathed in their lower part with a few gligmic, narrow leaves. Head round, terminal, composed of numerous close spikelets. Flowers on the outside of each spikelet male, on the inside female; glumes white; pili longer than the tube; style bifid. Involute four-leaved. Maryn inadvertently gives it twice, with precisely the same synonyms to both, but annexes Schreber's description to n. 6. and the younger Linnaeus's to n. 54. If they really belong to the same species, Linnaeus's plant must be a very singular variety with one-flowered spikelets, for such the pedicel determines them to be; it proves also that the species, whether one or two, ought not to be placed in the first section. Wahlenberg gives the following specific character of his cyperoides: " Spikelets male at the base, forming a head; glumes linear-bristle-shaped; fruit biculpidate; bracts clote together, foliaceous, long." A native of Bavaria, the Lowland and Sabina. 18. C. cinerea. Mart. 19. Lam. 16. Wahlen. 16. Hall. helv. n. 1. 157. Allion pedem. n. 2935. tab. 92 fig. 3. Schkuhr 25. tab. D and H. fig. 17. " Stem and leaves rigid, curved; spike single; glumes awned. Root perennial. Stems slender, naked, scarcely longer than the leaves. Leaves narrow, rough-hairy, three or four inches long, a little curved. Spike short, apparently simple, but composed of two or three clustered spikelets. Glumes lanceolate, acute, red, membranous, and whitish at the edges. A native of high mountains in Switzerland, Dauphiny and Piedmont. 19. C. incisa. Mart. 57. Lightfoot Flor. Scot. 154. tab. 24. Smith Flor. Brit. 10. Good enough. Wahlen. 19. Schkuhr 19. tab. H. fig. 25. (C. juncofolia; Allion. pedem. 2925. tab. 92. fig. 4. Flor. Dan. 432) " Spikelets clustered in a head; lower flowers female, bracts membranous; stem roundish, smooth; leaves channelled." Dr. Smith. Very nearly allied to the preceding, if it be more than a variety. Root perennial. Stems three inches long, ascending, naked, even, on the sea-flower curved, on moist mountains often straight. Leaves shorter than the stem, linear, channelled, even, nerved. Spike compound, short, nearly conic when in flower, obtuse when in seed; spikelets roundish, few-flowered, brownish. Blades shorter than the spikelets, partly embracing the flower-cone, elliptical, obtuse, slightly keeled. Glumes egg-shaped, brown, white at the edges, with a very slender keel. Fruit egg-shaped, acute, green, brown at the tip, undivided, smooth at the edges. Stamine capillary, very long, white. Stigmas two, brown. Seed lenticular. Lightfoot describes his plant as having no involucre and such it appears in his figure. Dr. Smith attributes to it two bracts which are represented very distinctly in Mr. Sowerby's figure in English botany. Dr. Goodenough was honoured with a fight of Lightfoot's original specimen in her majesty's herbarium, but fearful of doing any injury by handling it, forebore taking a minute description. We are doubtful of the figure in Flora Danica, though quoted both by Dr. Goodenough and Dr. Smith. It appears to differ not only in habit, but also in the structure of the pithe. If it be our plant it is taken in an advanced state of fructification, and without the bracteae. It seems probable that the latter may be generally pulled off by the ripening fruit. Specimens of this plant were sent to Dr. Horn from the deep, loamy sand at the mouth of the river of Navia, and from the valley of the Skern in Derbyshire and the Shetlands. Dr. Smith received others from Professor Beattie, gathered near Aberdeen. It flowers in July and August. 20. C. fastidiosa. Mart. 50. Lam. 7. Wahlen. 12. Allion. Flor. ped. 2397. Hall. helv. 1555. Scheuch. grami. 495. Prodr. tab. 4. t. p. 438. fig. 11. Villars Dauph. 2. 105. " Spike compound, egg-shaped, brown; spikelets clustered." Lam. Root perennial. Stem naked, triangular, often a little curved, about the length of the largest leaves. Leaves about three inches long, near two lines broad, tufted, gras-like, keeled. Spike short, a little conical, brown or black, naked at its base; spikelets ten or twelve, egg-shaped, acute, blunt, forming a regular cluster. Sometimes there are two long, pointed leaves under the spike, sometimes only one, and sometimes none. According to Haller the plant has an unpleasant smell, both green and dry. A native of boggy ground on mountains in Switzerland, Dauphiny and Piedmont. La Marck considers the juncofolia and fastidiosa of Allioni as the same plant, and quotes C. incisa of Lightfoot as a synonym; but Dr. Smith, who gathered both on the hill called Roche near Mount Cenis, has determined them to be perfectly distinct, and the juncofolia to be Lightfoot's incisa, though on the Alps it is seldom curved. Wahlenberg, on the
the other hand, makes all the three distinct species, and gives the following specific characters of the junctifolia and incurve.

21. C. junctifolia. n. 17. "Spikes feffile, male at the top, collected into a small oblong head; fruít rather roundish-depressed, attemerated; glumes two, ligulas two; item round, incised; leaves convolute; involucrums very short." C. incurve. n. 19. "Spikes seffile, male at the top, closely collected into an oblong, globular head, few, somewhat di-verging; fruít circum-rotate, ficipitiglous, beaked; orifice very entire; ligumas two; item rather acute; angular, somewhat incurve; leaves convolute." 22. C. junctifolia, Wahlen. 18. (Schauens monocics; Engl. bot. 1427.) "Spikes feffile, male at the top, clustered into a long spike; fruít oblong, attemerated, slightly beaked; orifice very entire; ligumas two; leaves very narrow, convolute." A native of Wiltmorland in England, sent to Swartz by Mr. (doublests Dawson) Turner. From this circumstance, added to its not being mentioned by any British botanist, we think it almost certain that this plant is no other than Schauens monocopus of English botany, which remained for some time undetermined, and as Dr. Smith observes, was taken by every body, even the Mr. Schkuhr, for a Carex: but in that case Wahlenberg has greatly erred in describing the fructification.

23. C. junctifolia, Hoff. Schkuhr. Car. 18. tab. G. and 1. fig. 32. "Spikes feffile, male at the top, collected into an ovate head; fruit ventricose, roundish, rather flatly convex, ribbed, slightly ferrated at the edge; orifice two-toothed; ligumas two; item acutely angular; leaves very narrow." 24. C. Blandifas, Linn. Sp. 5. Mart. 7. Lam. 9. Wahlen. 13. Vill. Dauph. 2. 196. tab. 6. Schkuhr. tab. 4. fig. 4. (C. aculeata, Becc. fig. ver. 1. 125. n. 9. gr. junctif. Benth. pl. 6. n. 12. prod. 13. tab. 13. Hall. 2. 599.) "Spikes egg-shaped, triangular, ternate, clustered, terminal, feffile; involucrums twofold." Linn. Root perennial. One leaf of the involucrums longer than the spikes, the other shorter. Spikes three or four, collected into a head, white, oblong; glumes of the male flowers on the upper part of the spiklets bacculate; of the female flowers gibbos; fylle long, three-cleft. Linn. Stem naked, triangular, at least seven inches high. Leaves all radical, rather narrow, half the length of the item Spikes three, feffile, short, reddish brown or whitish, forming a kind of three-lobed spike. Segraver. A native of Mount Baldo and the neighbourhood of Verona. La Marek thinks it must be rare, neitherb Haller nor Allioni having described it, and he himself having never seen it, but conjectures that the following may be a variety of it without the involucrums.

25. C. triperitum, Mart. 39. Allioni. ped. n. 239.8. tab. 92. fig. 3. Hall. helv. 1356. (C. lobata; Lam. 8. Wahlen. 23. Vill. Dauph. 2. 157.) "Spike compound, egg-shaped, somewhat lobed, terribus-brown, glumes mucronate." Linn. Root perennial. Stem triangular, naked, a little longer than the largest leaves. Leaves four or five inches long, two lines broad, tufted, gramineous, keeled. Spike short, naked at its base, commonly three-lobed; lateral, lobes very short; spiklets about twelve, feffile, male at the top, egg-shaped, clustered; ligumas two. A native of Switzerland, Dauphiny, and Piedmont. 26. C. bipartita, Mart. 60. Lam. 11. Allioni. pedem. 2301. tab. 80. fig. 5. "Stem round, naked; spikes two, upper one compound, terminal." Root perennial, fibrous, throwing out several ilems and leaves in a tuft. Stems four or five inches high, twice the length of the leaves, triated, cylindrical. Leaves gramineous, smooth, a little rolled in at their edges, irritated, acute, almost pungent. Spikes two, upper one an inch long; spiklets feffile, alternate, clustered; lower one near the other, shorter, egg-shaped, pedicellated; bracte reddish brown, acute; glumes egg-shaped, acute, not awned, brown, whitish at their edges as they grow old. Sometimes, but rarely there is a third spike beneath the other two. A native of spousy ground on the mountains of Piedmont.

27. C. drupa, Mart. 58. Goodenough 2. Smith. 33. Lam. 5. pers. 6. Trans. vol. 6. tab. 149. fig. 2. Wahlen. 27. Engl. bot. 1025. Schkuhr tab. v. feg. 61. (C. hybridus; Lam. 17. Gramen cyperoides ex monte Baldo. Spicã divulgã; Rai Syn. 443.) Spike once or twice compound; bracte leafy, erect; fruit mostly spreading; root creeping." Root perennial, creeping horizontally to a considerable extent, black, strong, twolied. Stem a foot high and more, upright, weak, naked, triangular; angles roughish upwards. Leaves narrow, upright, bright green, rough at the edges and keel, various in length. Spike an inch long, egg-shaped, often doubly compound at the base, of a dark ruby colour, denfe, rather compressed; spiklets several, irregularly clustered, egg-shaped, acute; female flowers low, much numerous, and flowering foemel, which, as Dr. Goodenough observes, offers a considerable elongation of the style waiting for their impregnation.

28. C. junctifolia, Hoff. Schkuhr. Car. 18. tab. G. and 1. fig. 32. "Spikes feffile, male at the top, collected into an ovate head; fruit ventricose, roundish, rather flatly convex, ribbed, slightly ferrated at the edge; orifice two-toothed; ligumas two; item acutely angular; leaves very narrow." 24. C. Blandifas, Linn. Sp. 5. Mart. 7. Lam. 9. Wahlen. 13. Vill. Dauph. 2. 196. tab. 6. Schkuhr. tab. 4. fig. 4. (C. aculeata, Becc. fig. ver. 1. 125. n. 9. gr. junctif. Benth. pl. 6. n. 12. prod. 13. tab. 13. Hall. 2. 599.) "Spikes egg-shaped, triangular, ternate, clustered, terminal, feffile; involucrums twofold." Linn. Root perennial. One leaf of the involucrums longer than the spikes, the other shorter. Spikes three or four, collected into a head, white, oblong; glumes of the male flowers on the upper part of the spiklets bacculate; of the female flowers gibbos; fylle long, three-cleft. Linn. Stem naked, triangular, at least seven inches high. Leaves all radical, rather narrow, half the length of the item Spikes three, feffile, short, reddish brown or whitish, forming a kind of three-lobed spike. Segraver. A native of Mount Baldo and the neighbourhood of Verona. La Marek thinks it must be rare, neitherb Haller nor Allioni having described it, and he himself having never seen it, but conjectures that the following may be a variety of it without the involucrums.
broad, green. Fruit spreading in every direction, egg-shaped, ribbed, mucronate, febrilely coniculate, not clavate, round on each side; ligmas two. Common in wet, rich, warm ground, flowering in May and June. All the English botanists took this for C. marna in of Linné, till the fortunate acquisition of the Linnean museum by Dr. Smith, they found their mistake. It is remarkable that La Maree fell into the same mistake. Dr. Goodenough, indeed, supposes that Linnaeus, and the Swedish botanists after him, confounded the two plants, not distinguishing the different position of the male and female flowers, a character which fails La Maree as a sufficient distinction between this species (his marnicia) and vulpina, though in other respects nearly allied. 30. C. curta. Vent. 61. Gooden. 5. Smith 4. Willd. Wild. Herb. Edel. 19. tab. 2. fig. 3. Schkuhr. 33. tab. C. fig. 15. (C. aculeata, Lightfoot. Flor. Dan. tab. 285. Lam. 21.) C. brizoides, Hudf. C. dongata, Leers 157. tab. 14. fig. 7. Gr. cyper. elegans, Rau Syn. 423. n. 6. and 7. 3d. ed. Pluks. Phyt. tab. 34. fig. 4. Rel. Rudb. 2. f. 54. C. cyper. spicis curtis divulsis. Leefcl. Pruff. 117. tab. 32.) "Spikeslets about six, elliptical, a little separate, naked; glumes egg-shaped, rather acute, membranous; tunic entire." Dr. Smith. "Root perennial, rather creeping. Stem a foot high, triangular, smooth except in the upper part. Leaves linear, flatly upwards, narrow, somewhat glaucous, roughish, nearly as high as the stem. Spikelets from four to six, or more, febrile, generally alternate, elliptical, obtuse, many-flowered; the lowest sometimes but rarely furnished with a bract; lower flowers male, fewer than the female. Glumes egg-shaped, membranous, remarkably tender; white, shining, with a flender green rib. Fruit egg-shaped, compressed, acute, smooth; ligmas two. Seed exactly elliptical. A native of watery places in England and Scotland and other parts of Europe, readily distinguished in a state of maturity by its shiny spikelets. 31. C. canecacea, Linn. Sp. Pl. 16. Mart. 17. "Spikelets roundish, remote, febrile, obtuse; fruit egg-shaped, rather obtuse." Similar to curta; so much so that Leefcl's figure referred by Dr. Goodenough and Dr. Smith to curta, is almost equally expressive of both; but when they are brought together, a wide difference presents itself. The curta is smaller in all its parts; its bracteae, moreover, are silvery and very tender; whereas in the canecacea they are membranous and hard, as in the root of the genus, and are brown with a white edge, which gives it a real, hoary appearance. See Dr. Goodenough's remarks in Linn. Trans. vol. ii. p. 147. Wahlenberg, however, not withholding what has been advanced by Dr. Goodenough, unites the curta of that able botanist with the canecacea of Linnaeus, (at least of the flora Suecia,) under the following specific character. "Spikelets five, male at the base, rather near together; glumes nearly as long as the fruit; fruit roundish-ovate, rather acute, convex on one side, leafo on the other; angles rather obtuse; one two-toothed; ligmas two. B. "Upper spikelets aggregate; fruit spreading, acute, convex on one side, nearly flat on the other; angles rather acute." 32. C. elongata, Linn. Sp. Pl. 15. Wahlen. 41. Schkuhr tab. E. fig. 25. "Spikelets oblong, febrile, remote; fruit egg-shaped, acute." Linn. "Upper spikelets male at the base, rather near together, in a kind of raceme; rather densely fleshy; glumes farrifith; fruit oblong-acuminate, convex on both sides, obtusely angular, ribbed, curving a little outwards; orifice nearly entire; ligmas two." Wahlen. A native of Europe. 33. C. foliacea, Linn. Sp. Pl. 15. Wahlen. 47. Schkuhr tab. P. p. 10. "Spikelets somewhat egg-shaped, roundish, febrile, remote; fruit egg-shaped, roundish, not awned, divaricata."
and axillaris. 12. Mart. 17. Lam. 23. Wahlen. 51. Eng. Bot. 832. Flor. Dan. 372. (C. angulifolia capitula pulchella, Mich. Gen. 70. n. 2. tab. 33. fig. 15. 16. Gram. Cyp. Rai. Syn. p. 423. n. 11. Pink. Phyt. tab. 43. f. 3. Maris. £. 8. tab. 12. f. 173.) " Spikelets alternate, solitary, near the edge. Spikelets alternate, solitary, eggl-shaped, white, about six or eight; three or four of the lowest very diffus; bracteae gramineae; male flowers lowell; glumes broad-egg-shaped, membranous, white, with a green keel. Fruit egg-shaped, acuminated, longer than the glume, obtuse at the edge in the upper part, generally acute at the orifice; Rigma two. " Seed (long) " a native of moist groves, and banks of ditches, in fandy places, flowering in May and June. 41. C. gibba, Wahlen. 53. (C. remoti, Thumb. Floir. Jarg.) " Spikelets male at the base; lower ones somewhat ternate, rather diffus; glumes short; fruit somewhat lenticular, beaved, very convex on one side, a little fo on the other, thin and entire at the edges; orifice two-toothed; Rigma two; bracteae foliaceous, long, rather narrow; leaf limb." A native of Japan. 42. C. axillaris, Mart. 12. Gooden. 8. Smith Flor. Brit. 9. Linn. Tran. v. 2. tab. 19. fig. 1. Wahlen. 53. Eng. Bot. 993. " Spike interrupted; lower spikelets in remote clusters; upper ones solitary, all feefe; bracteae elongated; seed-ficile-convex. " Root perennial, fibrous. Stem erect, strong, Rifft, from to three feet height; triangular; angles rough. Leaves shorter than the stem, rough at the edge, and near the tip of the keel. Spikelets more turgid than thoofe of C. remoti; the lowest bracteae about the height of the stem; the others shorter. Lower flowers male; glumae egg-shaped, acute, ornerous, bowmifh, with a green keel. Fruit egg-shaped, acuminated, a little longer than the glume, obtuse at the edges near the tip; Rigma two. " A native of wet ditch banks, flowering in June. The axillaris of Linneas is nothing more than his remoti, infected through inadvertence with nearly all the same synonyms, and with no material difference in the specific character. Dr. Goodenough observes, that Buddle is the first who noticed this species, and distinguished it from the more common remota. A specimen is preserved in his Herbarium. p. 31. n. 6. It has been found since by Mr. Curtis near Putney, and by Mr. Woodward near Norfolk. 43. C. chordoriza, Linn. Jun. Sup. p. 414. Mart. 07. Wahlen. 22. Schkuhr 17. tab. G. fig. 31. Ehrl. Phytot. 77. " Spikelets male at the base, rather close together; fruit semi-globular, woody, elongated at the base; Rigma two; lowest leaf very short; the other sheaths leafless; root flender, creeping." Wahlen. A native of Sweden. 44. C. betoeyum, Linn. Jun. Sup. 68. Ehr. Phytot. n. 28. Wahlen. 45. Schkuhr. 42. tab. 11. f. 97. " Spikelets four, male at the base, crowded, somewhat globular; glumes nearly as long as the fruit; fruit egg-shaped, acute, convex on one side, a little fo on the other, rather obtusely angular, spreading; Rigma two; leaf Retail. " A native of Sweden. 45. C. ovalis, Mart. 65. Gooden. 6. Smith Flor. Brit. 7. Eng. Bot. 306. (C. leporina, Hudf. Relh. Sibth. Lam. 16. Leers. t. 14. f. 6. Ehr. Phyt. n. 38. Gram. cramer. spica e pluribus ficicis, &c. n. 2. Schuchz. tab. 10. f. 19. Morif. tab. 12. f. 290.) " Spikelets about fix, oval, near together, alternate; glumes lanceolate, as long as the fruit." Root perennlal, creeping. Stem a foot high or more, erect, acutely triangular, rough at the angles, leafy at the base. Leaves deep green, flat, keeled, nearly as long as the stem, and flecting its lower part, alternate, roughifh on the edge and keel. Spikelets from four to fix, of a ruby green colour, elliptical; bractteae at the base of each spikelet lanceolate; the lower one longer than the roll, and ending in a leafy point; male flowers inferior, few; females numerous; glumes egg-lanceolate, acute, membranous at the edge, with a green keel. Fruit lanceolate, acuminate, convex on one side, nearly entire at the orifice, rough at the edge; Rigma two. " Seed roundifh, elliptic. Dr. Smith. Common in wet marshy places, flowering in July. 46. C. leporina, Linn. Sp. Pl. 8. Wahlen. 3. " Spike compound; spikelets egg-figured, yellow, near together, after the manner of cornflowers; the flowers to Maton and Schuehler, confounded this species with the preceding. It is, however, as Dr. Goodenough observes, perfectly diftinguifhible. The fpecimen in Linneas's herbarium, now in Dr. Smith's collection, is a smaller plant, with only three nearly glofular bifpikelets, blunt and shorter glumes, and fruit entirely smooth. It is a native of the higher Alps. Wahlenberg nevertheless still confiders the leporina of Linneas, and the ovalis of Goodenough, as one and the fame plant. 47. C. divus, Mart. 55. Gooden. 14. Smith Flor. Brit. 15. Schkuhr 12. tab. Ww. fig. 89. Eng. Bot. tab. 629. (C. canecenae, Hudf. a. M. curieae; 8. Wahlen. 28. C. nemorofa spica longa divus, &c. Mich. Gen. 69. tab. 33. fig. 10. Gram. Cyper. spica longa divus. Rai Syn. p. 424. n. 11.) " Spike elongated, twice compound, often branched at the base; lower fpkelets remote; fruit nearly erect, nearly smooth at the edge." Root perennial, fibrous. Stem a foot high or more, weak, somewhat reclining, naked, acutely triangular; angles rough, especially near the tip. Leaves narrow, longer than the stem; edge and keel rough. Spike interrupted; its lower parta pale green; lower wedgelets remote, sometimes in pairs; the lowest often compound; bracteae small, broad-egg-shaped, sharply keeled, ending in a rough bristle-shaped leaflet, often longer than the spikelet; upper flowers male; glumae egg-shaped, acute, white; lower ones generally with a green keel. Fruit egg-shaped, convex on one side, without ribs, smooth, white, green at the tip, cleft or only at the tip; Rigma two. Seed orbicular, comprefled. A native of moif woods, flowering in May. 48. C. Schreberi, Wahlen. 35. Wild. Schkuhr 30. tab. B. fig. 9. " Spikelets five, male at the base, somewhat chiftered; glumes as long as the fruit; fruit ovate-ovate, rather acute, a little convex, rather acutely angular; orifice margi- nate; leaves very narrow; root creeping." A native of family near Berlin. 49. C. lagopina, Wahlen. 37. (C. leporina, Fl. Dan. tab. 214. Approximata, Hoppe Herb.) " Spikelets three, male at the base, clustered; glumes rather small; fruit somewhat circinate, acute, somewhat beaked, convex on one side, a little concave on the other, obtuse and quite entire at the edges; orifice two-lipped; Rigma two." A native of the Lappland mountains. 50. C. Frymuin, Wahlen. 38. Wild. Schkuhr 38. tab. G. fig. 34. " Spikelets five, male at the base, a little dittant, somewhat globular; glumes lanceolate, as long as the fruit; fruit roundifh-in- feriorly egg-shaped, beaked, membranous at the edges; orifice bifid; Rigma two. " A native of North America. 51. C. vulsima, Lin. Sp. Pl. 10. Mart. 11. Lam. 19. Gooden. 15. Smith 16. Eng. Bot. 307. Leers, tab. 14. fig. 5. Flor. Dan. tab. 308. Wahlen. 29. Schkuhr. 10. tab. C. fig. 10. (C. paludis major, Mich. Gen. 9. tab. 33. fig. 13. Gram. Cyper. Rai Syn. 423. n. 8. Morif. t. 8. tab. 12. f. 24. G. patinae cyperoides, Ger. Em. 213.) " Spike thrice compound, compressed, obtuse; fruit diverging; glumes acuminated; flens with comprefled, very acute angles. " Root perennial, fibrous, forming thick tufts. Stem two feet high, erect, Rifft, strong, ofen contracted in a fingular manner, when it becomes the rachis of the spike, concave and acutely
acutely triangular; angles very rough. Leaves deep green, broad, higher than the stem, rough on the edges and keel. Spike oblong, sometimes a little interrupted; spikelets egg-shaped, upper flowers male; bracteas egg-shaped at the base, bristle-shaped at the tip, rough, spreading widely; glumes egg-shaped, acuminate, membranous, brown, with a green keel. Fruit diverging, egg-shaped, acuminate, convex on one side, ribbed, cleft, and rough at the tip; ligmas two. Seed elliptical-ovate. A native of marshes and the banks of rivers. 52. C. glomerata. Thumb. (C. vulpina, 2. Wahlen.) " Spike oblong; stem obtusely angular; leaves broad, rather short. A native of the Cape of Good Hope. 53. C. brizoides, Lem. Sp. Pl. 18. 18. 29. Cana, n. 1172 Wahlen. 39. Schkuhr tab. 2. fig. 12. (C. specia teretiusculus alternis fe contiguousibus. Hall. Helv. 244. Mich. Gen. tab. 33. fig. 17.) "Spike compound, two-ranked, naked; spikelets oblong, contigious; stem naked." It appears from the herbarium of Linnaeus that, early in life, he called the curta of Dr. Goodenough brizoides, there being a specimen of it so named by himself; but afterwards, as our excellent naturalist observes, he seems to have forgotten his own original determination upon the matter, for the specific character given in the Species Plantarum must have been intended for another plant. There is a specimen in the herbarium of Sir Joseph Banks, named brizoides, which answers entirely to this specific character, to the synonym of Haller, and to the figure of Micheli, and which Dr. Goodenough is perfused is the brizoides of the Species Plantarum. It is the only specimen he has seen, and he has drawn the following description from it. Root perennial, creeping. Stem erect, naked, triangular; angles acute, rough. Leaves pale green, flender, longer than the stem, rough on the edges and the keel; the lower ones shorter and shorter on the other side. Bracteas about seven, round, or a little oblong, rather in two ranks, near together, moll frequently contigious; lower flowers males; glumes oblong, acute, pale, with a green keel, somewhat tender, with a delicate white edge, about as long as the fruit. Fruit oblong, acute, smooth, somewhat triangular, minutely ferrated at the edges, cleft at the tip, flat on one side; ligmas two. Dr. Goodenough adds, that the true brizoides is very properly described by Schreber in his Spicilegium Fl. Lipl. p. 63. n. 675. See Linn. Transf. vol. ii. p. 148. According to La Marck it differs from C. ovalis, his leporina, in having its spikelets longer, acute, more flender, and not compacted. His description does not materially differ from Dr. Goodenough's, but he observes, that the spikelets are often curved, like those of bromus pininus. Wahlenberg gives the following specific character, which identifies his plant with those described by Goodenough and La Marck. "Spikelets numerous, male at the base, contiguous, somewhat lanceolate, sometimes curving outwards; fruit ovate-lanceolate, very convex on one side, a little concolor on the other; spikelets five, finely ferrated at the edges; orifice bifid." A native of France, Switzerland, and Carniola. 54. C. microperma, Wahlen. 30. " Spike thrice compound, thickish; spikelets, male at the top, clefted; glumes pointed; fruit small, ventricose-ovate, with a short acuminate beak, acutely angular, somewhat diverging; ligmas two leaves rather narrow." A native of Pennsylvania, preferred in the herbarium of Thunberg. 55. C. arenaria, Linn. Sp. Pl. 6. Mart. 8. Lam. 14. Gooden. 10. Smith 11. Wahl-n. 32. Eng. Bot. 928. Schkuhr 8. tab. B. fig. 6. (C. maritima humilis, Mich. Gen. 67. tab. 33. fig. 4. Rai Syn. p. 423. n. 5. Pluk. Phyt. tab. 34. fig. 8. locul. Plufr. tab. 31.) " Spikelets clefted, spliced, almost monocious; bracteas membranous; lower ones granimous; stem triangular; leaves flat." Root perennial, creeping just below the surface in all directions, fealty, with downy fibres. Stem a foot high, numerous, erect, except when they are borne down by the sand, naked, sharply triangular, roughish in the upper part. Leaves spreading the base of the stem, erect, acuminate, rough at the edges. Spike egg-shaped, compound, compressed; spikelets alternate, two together, brown, many-flowered; bracteas lanceolate, keeled, membranous at the base, the lower ones lengthened out into a leaf; male flowers in the upper part of each spikelet, very numerous in the upper spikelets; females milu numerous in the lower; glumes egg-lanceolate, brown, free, united to the stem, flat, acute, ribbed, bordered with a membrane on each side on the other part, rough at the edge, cleft at the tip; ligmas two. Seed elliptic or obscurely triangular. Frequent among the sand of the sea-flower, flowering in June. 56. C. repens, Bellard. App. Flor. Pedem. (C. arenaria, 2. Wahlen.) " Spikelets rather near together; bracteas small, scaly, awn-knots; stem roundish. A native of Pedmont. 57. C. intermedius, Gooden. 11. Smith 12. Wahl-n. 31. Schkuhr 9. tab. B. fig. 7. (C. diliicta, Mart. 55. Hufl. Reh. Systhopt. C. arenaria, Leers, tab. 14. fig. 2. C. picata, Pollin. n. 875. Lam. 15. Rai Syn. p. 423. n. 4. Pluk. Phyt. tab. 34. fig. 7, not good. Moref. 8. tab. 12. t. 32. " Spikelets clutered, spliced, some of the lowest and the terminal one female; intermediate ones male; stem triangular, erect." Root perennial, creeping, but striking deep into the ground. Stem a foot high and more, erect, flif, naked, acutely triangular, rough at the angles. Leaves spreading the base of the stem, scarcely as high, erect, flat, roughish at the edge and on the keel. Spike oblong, obtuse, rough-brown, fof, little compressed, not at all two-ranked; spikelets near together, numerous, imbricated towards the top, egg-shaped, often one or two male flowers at the top of the female spikelets, and one or two female ones at the base of the males; bracteas egg-lanceolate, membranous, keeled, brown, with a white edge; lower ones ending in a bristle-shaped leaf; glumes egg-shaped, brown, with a pale nerve, membranous and white at the edge. Fruit egg-shaped, acute, bordered with a membrane on each side, rough at the edge, cleft at the tip; ligmas two, sometimes three. A native of marshy ground. 58. C. uliginose, Linn. Sp. Pl. 7. Mart. 9. Lam. 13. " Spike compound; lower spikelets remote, furnished with a long granimous bracte; item round." Similar in appearance to C. arenaria, but the root is not manifely creeping. Stem a finger's length, round, glossy, naked. Spike more compacted than in any other species, rust-colour spikelets seven or eight; at the base of the spike there is a leaf of the same length with it, erect, glossy, linear. Leaves next the root alternate, convex beneath, channelled above, glossy on both sides, linear, acuminate, hispid, as long as the stem. A species frequently known, and not retained by Wahlenberg. 59. C. paradoxa, Wahl. 24. Wild. Aet. Berol. Schkuhr. 23. tab. E. fig. 21. " Spikes male, forming a panicle; lower branches a little disent; fruit roundish-oval, slightly convex; angles rather obtufe; orifice two-toothed; ligmas two." A native of wet ground about Berlin and Hall. 60. C. teretiuscula, Gooden. 16. Smith 15. Linn. Transf. v. ii. tab. 19. fig. 3. Eng. Bot. 1055. (C. paniculata, 2. Wahlen. C. diandra, Schlank.) " Spike twice or thrice compound, denfe, rather pointed; spikelets clefted; spliced spreading, g-bbous; item roundish." Root fibrous, somewhat creeping, not from a tuft. Stem a foot or a foot and a half high, acutely triangular, but the sides between the
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the angles are convex, which gives it the roundish appearance expressed in the trivial name. *Leaves erect, somewhat rigid, about the length of the stem, rough at the edges and on the keel. Spike oblong-egg-shaped; spikelets egg-shaped; upper flowers female; bracts egg-shaped, membranous, the lowest with a rough, often very short foliaceous point; glumes egg-shaped, brown, membranous at the edge, white, with a very even keel. Fruit brown, egg-shaped, acuminate, very convex on the outside, rather flat on the other, gibbous on both sides at the base, hispidly ferricated on both sides near the tip, greenish cloven at the tip; ligmas two. Seed orbicular, gibbous on the outside. A native of boggy ground. Mr. Crowe of Norwich is the first English recut discoverer of this plant, but it was known to Ray, as is evident from the addition to his description of the next species. Synop. p. 197. 18th. ed. 422. 53. *C. pachyandra, Linn. Sp. Pl. 17. Mart. 18. Lam. 24. Weyl. 25. Leers tab. 14. fig. 4. Eng. bot. 1054. Schkuhr 23. tab. C. fig. 20. (C. ficica multiplici ferrugineae; Mich. gen. 68. tab. 53. fig. 7. C. ficica longiroei lata. Rax Syn. 422. n. 1. Morill. § 8. tab. 12. fig. 25. Cyperus alpinus longus inodorus; Schucezh. Prod. 27. tab. 8. fig. 2.) Spike trichome compound, panicle branched, acute, interrupted; fruit spreading, bracted; seed acutely triangular, with a bristle-shaped keel. Glumes two. Fruit egg-shaped, convex on the outside. The spike varies in being more or less branched. A native of wet, sandy ground, flowering in June. *C. rivularis, Wahlen. 26. Wildlen. Schkuhr 21. tab. C. c. fig. 87. "Spikelets male at the top, five, rather near together, oblong; glumes as long as the fruit, mucronate; fruit roundish-ovariculate, somewhat beaked, membranous at the edge near the tip; orifice divided, ligmas two." A native of Hungary on the banks of rivers. *C. flaccis, Wahlen. 55. (C. indica, Schkuhr 27. tab. B. b. fig. 85.) "Spikes compound; branches aggregate, male, and linear at the top; glumes oval; bracteoles flat, triangular, nearly globular, rather obtuse; orifice margiunate; ligmas three: leaves narrow, a little incurved at the edges. A native of the Cape of Good Hope. 64. C. indicus, Linn. Mant. 574. Mart. 19. Lam. 26. Wahlen. 56. "Spike cylindrical, panicked, pinnate; a few of the lowest flowers female." Linn. Semen a foot and a half high, erect, obscurely triangular, smooth and even. *Leaves on the stem remote, rough at the edges, often longer than the stem. Panicle formed of many alternate, flill, triangular, spreading racemes; spikelets alternate, nearly sessile, in two rows, remote, spreading, imbricated on all sides with awl-shaped scales, with two or three female flowers at the base; bracteoles falcate. Fruit egg-shaped, acute, triangular. Linn. Stigmas three, Wahlen. A native of the East Indies. 55. C. polyplachys, Wahlen. 57. Swartz. Flor. Ind. Occid. App. "Spikes compound, pinnate; branches crowded, numerous, attenuated upwards, glumes three; glumes lanceolate; bracteoles falcate; fruit lanceolate, with an awl-shaped recurved beak; seed fluff. A native of the highest mountains in Jamaica. 66. C. clavatula, Wahlen. 58. (C. succidea; Swartz. Append.) "Spikes compound; branches rather near together, few, weak, with scattered flowers; glumes lanceolate, bracteoles falcate; fruit oblong; with an awl-shaped beak curving outwards, ligmas three; stem falcate; leaves very narrow." A native of mountains in Jamaica. 67. C. faberlii, Wahlen. 59. (C. laca; Swartz. Flor. Ind. Occid. App. "Spikes compound; branches clustered, somewhat globular-ovate; bracteoles falcate; fruit ovate, acute, a little curved outwards; ligmas three; stem feebly, leaves very narrow." A native of mountains in Jamaica. 68. C. crinata, Wahlen. 62. "Spikes double compound; branches and branchlets divergent; bracteoles falcate; fruit ovate, with a short beak rather curved outwards; ligmas three." A native of the neighbourhood of Canton in China. 69. C. ovata, Rudge in Linn. Trans. vol. 7. p. 96. tab. 9. fig. 1. "Spikes egg-shaped, pendulous; fruit egg-shaped, acute." Stem erect, triangular; angles acute, rough. *Leaves erect, slender, rough at the edges. Spikes four or five, peduncled; flowers densely imbricated; glumes egg-shaped, acute, brown, as long as the fruit; bractes at the base of the peduncle a little embracing the stem. Fruit egg-shaped, compressed, acuminate, cloven at the tip; ligmas three, glandular, rather thick. A native of Newfoundland. 70. C. magellanica, Lam. 25. tab. N. fig. 51. (C. oblongo-lanceolata.) Spikes oblong, on long peduncle, fruit compressed, lenticular. In habit and face resembling Juncus commelina. Stem five or six inches high, leafy. *Leaves as long as the stem, two lines broad, smooth, flat, straight. Spikes three or four, half an inch long, brown or blackish, a little compressed; peduncles almost capillary, the length of the spikes; glumes brown, acuminate; bracteoles falcate. Fruit smooth, compressed, lenticular, yellowish, shorter than the glumes; ligmas three; gathered by Commoner in the fruits of Magellan. 71. C. brunnnea, Mart. 20. Lam. 27. Wahlen. 59. Thum. Flor. Japon. p. 38. Schkuhr tab. X x. fig. 3. "Spikes peduncled, linear; male flowers at the top." Stem a foot high, triangular, falcate. *Leaves linear, acute, liriiated, keeled, entire, smooth, bright, longer than the stem. Spikes about twelve, half an inch long, pointed, straight, smooth, on capillary peduncles; glumes egg-shaped, acute; ligmas two. A native of Japan. 72. C. fabulata, Wahlen. 69. "Spikes narrow, rather long, somewhat densely flowered, male at the top; peduncles falcate; fruit ovate, triangular, shorter than the glumes; glumes ending in an awn much longer than the fruit; fruit ovate, triangular, depressed, beaked, bicuspitate; ligmas three; leaves broad." A native of the Isle of Bourbon. 73. C. Forsteri, Wahlen. 81. (C. debilis; Forl. C. recurvata; Schkuhr 100. tab. N. fig. 84.) "Spikes on long naked peduncles, cylindrical, pendulous, male at the base; bracteoles with rather long falcate, foliaceous, very long, remote; fruit oblong-ovalate, attenuated, with an awl-shaped recurved beak; male spikes two; ligmas three. A native of New Zealand. 74. C. atrata, Linn. 26. Mart. 77. 31. Lam. 12. Wahlen. 114. Gooden. 36. Smith 28. Flor. Dan. 158. Schkuhr 41. tab. X. fig. 77. (Cyperoides alpinum spicis atriis; Schucezh. Agr. 487. tab. 11. fig. 2.) "Diandrous; spikes egg-shaped, peduncled, at first upright, pendulous in fruit, peduncles feebly falcate; male flowers at the bottom of the terminal spike; fruit compressed." Root perennial, foliaceous. Stem a foot high and more, erect, triangular, liriiated, leafy at the base; angles feebly rough. *Leaves shorter than the stem, bright green, broad, flat, rough at the edges. Spikes often four, egg-shaped, dense, many flowered; terminal one with male flowers below, female above; the others with female flowers and a mixture of diandrous hermaphrodites; bracteoles foliaceous, embracing the stem but feebly falcate, spreading; the lowest often longer.
longer than the stem; peduncles triangular, smooth and erect; glumes eggy-shaped, black. Fruit indistinct, a little shorter than the glumes, broad-elliptical, compressed, yellow, without ribs, smooth, scarcely hanked, emarginate at the tip. Spike triangular, short, brown, ligulam-three. A native of mountains in Wales, Scotland, and other parts of Europe. 75. C. digitata, Link. 19. Mart. 32. Lam. 190. (Hall. helv. 1875.) Gram. carophylli Nemorti, forma multiplici. Bahn. 184. 4. Schkuhr, 456. Ang. nutt. folio, Moril. hist. 3. p. 243. 4.1. Cypereides Mitch. gen. 65. tab. 32. f. 14.) "Male spikes fiddle, oblong; lower one axillary: leaves almost thread-shaped." Nearly allied to the preceding, but smaller, with narrower leaves and spikes nearer together, mutuating at a hard foot. L. Marek. Root perennial. Stem naked, slender, about the length of the leaves. Leaves four or five inches long, (to, Lam.) near a line broad, falcate-acute, acute, fruirated. Spike one male, two female, nearly on a level; one female lower, proceeding, according to L. Marek, from an oblong, membranous, reddish sheath; according to Link, from the axil of a leaf as long as the stem. Fruit a fiddle-shaped. A native of mountains in Lapland, Switzerland, Dauphiny, and Piedmont. Wahlenberg confers the peduncle of Schkuhr 62. tab. 11. fig. 37 as only a variety of digitata; and affords that the peduncle of Linnaeus is not now known to the Swedish botanists. St. C. clandellina, G dou. Smith 20. Wahlen. 190. Schkuhr 67. tab. X. fig. 44. (prostrata. Mart. 190. Leyser. 175. Villars Dauph. 2. 205. SchuBb. Spic. flor. l. 1613.) Scario. Lam. 37. Cypereides montana, SchuBb. 407. tab. 10. fig. 1.) "Braetes membranos, seldom foliaceous, fheathing; female spikes remote, few-flowered, enclosed in the sheaths; leaves channelled." Root perennial, fibrous. Stem in tufts, an inch or two long, rather erect, obviously triangular, smooth. Leaves three times as long as the stems, erect, deep green, very rough at the edges. Male spike terminal, solitary, erect, lanceolate, many-flowered; braetes sheathing, membranous, obtuse; glumes imbricated, lancetolate, brown, membranous and white at the edge; females two or three, lower, remote, alternate, peduncled, small, few-flowered, (two, sometimes one-flowered, Lam.) each coated with its bracte. Fruit inversely egg-shaped, triangular; orifice entire; tigmas three. Seed triangular. The leaves which overshadow the stems at their first appearance are those of the preceding year, which usually continue green till their predecessors take their place. A native of mountains in Switzerland and Dauphiny. In England it has hitherto been found only on exposed sunny spots about St. Vincent’s rocks near Bristol. The singular circumstance of the braetal sheaths enclosing the female spikes as well as their peduncles, induced Dr. Goodenough to call the species clandellina, a trivial name which is to be preferred as being differenitatively expressive, though it has not the claim of priority. 81. C. alta, Mart. 72. Wahlen. 104. Schkuhr 88. tab. O. fig. 55. Scop. 1948. Allion. pedem. 2322. (Hall. helv. 1377. Scheuchz. tab. 10. fig. 4. Mich. gen. 61. n. 79. 80. C. argentea, Villars Dauph. 2. 206.) "Spikes peduncled, white, sheaths long, obtuse; filaments and style long, white." Stem round, slender, with three white leafy sheaths. The two upper spikes from one sheath, the lower fingle. Glumes of the male spike almost transparent; of the female spikes keeled, acuminate; anthers terminating in a lucid point; female flowers few. Fruit turgid, roundish, smooth, frurated, growing black in autumn. Seed triangular, shining, acuminate. Linnaeus was either unacquainted with this species, or confounded it with digitata. Scop. 83. C. Pennsylvanica, Lam. 36. "Spikes variegated with brown and white; male terminal, obtuse; female fiddle, egg-shaped, either with or without a bracte." Stem one or two inches high, upright, very slender, triangular, leafy only at the base. Leaves scarcely half the length of the stem, lefs than a line broad, flat, frurated. Male spike terminal, upright, a little acute; glumes obtus. 4 C"
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oblung, obtuse, smooth, reddish brown, membranous and white at their edges. *Female spikes* a little below the male, sessile, egg-shaped, short, few-flowered, sometimes without, and some with a bract, scarcely the length of the spike; glumes similar to those of the male. At the base of the male spike there is sometimes the rudiment of another female spike not distinctly separated from it. A native of Pennsylvania and New York. 84. *C. faginea*, Wahlen. 100. Wahlen. (C. glomerata, Schkuhr 65, tab. 1, fig. 41.) "Female spikes about two, nearly sessile, globular; bracts somewhat embracing the item, leafy, crowded; fruit nearly globular, beaked; orifice two-lipped; stigma three; male spike slender; leaves very narrow." 85. *C. sarca*, Wahlen. 175. "Female spikes few-flowered, nearly sessile; male, slender; bracts somewhat embracing the item, leafy, crowded; fruit nearly globular, beaked; orifice two-lipped; stigma three; male spike slender; leaves very narrow." A native of North America. 86. *C. pilulifera*, Linn. Sp. Pl. 24. Mart. 28. Lam. 29. Gooden. 37. Smith 37. Eng. bot. 885. (C. montana, Linn. Sp. Pl. 21. Hud. 407.) *C. pilulifera*, Fin. Dan. tab. 1043. C. conglobata, Mari. 70. Allion. pedem. n. 2314. Hall. leh. n. 1372. Scheuch. tab. 10. fig. 8, 9. *Gra men cypérôides*, Rau syn. p. 421. n. 19 and 20. Pluk. Phyt. tab. 91. fig. 8.) "Bracteal sheaths none; female spikes sessile, crowded, roundish, glumes mucronate; fruit roundish, villous." *Root* perennial, fibrous. *Stem* often recurved, incurved, about nine inches high, feebly, naked, rough near the top. *Leaves* deep green, rough at the edges and on the keel. *Bracteas* bristle-shaped, short, triangular, feebly at all sheathing. *Male spike* lanceolate, acute; glumes of a rusty brown colour, lanceolate, acute, with a green keel, and a membranous white edge. *Female spike* two or three, feebly, close together, roundish, spreading; glumes egg-shaped, acute, coloured like those of the male. *Fruit* shorter than the glumes, roundish, obliquely triangular, green, villous on all sides. *Seed* nearly globular, yellowish. It varies with blunt glumes, less conspicuously keeled. Dr. Smith. This is certainly the *C. montana* of the Linnean herbarium, and Dr. Smith concludes from the reference to Plukener, that he described it from that author as his original *piulifera*, without having a specimen before him. Dr. Goodenough thinks it certain that the *pike* of oncid and the same plant under two names; in its more fruitful state with three female spikes, calling it *pilulifera*, and in its more starved appearance when produced on elevated dry plains, where it has only two, and sometimes only one, *montana*. La Mareck has a montana which he thinks may possibly be the montana of Linnaeus, excluding the synonymy. It seems to differ from pilulifera in having shorter leaves, blackish spikes, and fruit more evidently dry, and quotes as probable syn- onyms, cypérôides and *faginea*. Two species of C. pilulifera, from different localities, are described by Scheuchzer. This is from Switzerland by M. Vahl. Wahlenberg, who with respect to Swedish plants must be good authority, determines the pilulifera and *montana* of Linnaeus to be different plants, and gives the following specific characters. *C. pilulifera*, n. 112. Wahlen. Schkuhr 46. tab. 1. fig. 39. "Spikes nearly sessile, globular; male, slender; bracts partly embracing the item, somewhat foliaceous, attenuated, near together; glumes mucronate, rather long; fruit somewhat globular, acute, pubescent; stigma three; item feebly, finely ferrate." 87. *C. montana*, Linn. Wahlen. 109. Schkuhr 53. tab. F. fig. 29. "Spikes rather few-flowered, nearly sessile; bracts crowded, somewhat scaly, embracing the item; keel cupulitate; bracts pitch-coloured, mucronate, as long as the fruit; fruit oval-wedge-shaped, rather acutely triangular, a little rough; stigma three; leaves very narrow." 88. *C. mucronata*, Mart. 71. Wahl. 40. Allion. pedem. n. 2318. Hall. leh. 1374. Mich. gen. tab. 32. fig. 3. Schkuhr 46. tab. K. fig. 44. "Spikes sessile, near together, very short; glumes lanceolate, mucronate." *Stem* a foot high, naked at the top. *Leaves* rush-like. *Spikes* generally three; male, longer; round; females two, five-flowered; glumes oblong, ovate-lanceolate, pale about the edge; nerves yellow, shining, bracteal leaf of the lower spike with a long ferner point, much longer than the spike. Haller. *Stiga* two. Wahlen. 89. *C. congiobata*, Linn. Mart. 17. Mart. 27. Lam. 32. Smith 38. Leers. 200. tab. 15. fig. 7. Wahlen. 108. Schkuhr 51. tab. F. fig. 29. "Bracteal sheaths very short; female spikes nearly sessile, cylindrical, obtuse; glumes elliptical, acute; fruit downy." *Root* perennial, creeping. *Stem* a foot high, erect, naked, acutely triangular, angles near the top rough. *Leaves* shorter than the item, erected, flat, bright green, roughish both sides, and at the edges. *Bracteas* foliaceous, a little spreading, scarcely longer than the item. *Male spikes* lanceolate, rather obtuse; glumes lanceolate, of a rusty brown colour, with a green keel, the upper ones slightly mucronate. *Female spik es* generally two, not very near together, cylindrical, obtuse, various in length, on short peduncles; glumes elliptic-egg-shaped, scarcely mucronate, of a rusty brown colour, with a bright green keel. *Fruit* about the length of the keel, densely imbeded, roundish, a little compressed, feebly triangular, green, clothed on all sides with dense, short down, which at first is white, and finally of a gold colour. *Seed* white, obliquely triangular. Dr. Smith. *Stiga* three. Wahlen. Found by Mr. Telfitie in meadows near Merfon Morely, Wiltshire. La Mareck's plant, which does not materially differ, was gathered in the neighbourhood of Paris. 90. *C. fasciata*, Linn. Sp. Pl. 25. Wahlen. 140. (C. esculentum alpinum fasciata, Mich. gen. gen. 23. tab. 32. fig. 41.) "Spikes three, egg-shaped, sessile, alternate; male oblong." *Terminal* spike male, of a pale rusty colour. *Female spikes* two, the lower one with a bristle-shaped leaf, shorter than the spike; glumes the length of the pedicel; germs black, triangular; styles black, bifi, long. A native of the mountains of Lapland and Switzerland. La Mareck supposes that it feebly differs from the preceding. Wahlenberg gives it the following character, which proves it distinct. "Spikes nearly sessile, rather densely flowered, very obtuse; male oval; glumes circinate, white at the edge; bracts partly embracing the item, with sharp angles, foliaceous, very narrow, dilated; glumes nearly as long as the fruit; fruit oblong, oval upwards, flat on both sides, rather acute, a little curved outwards; orifice equals; stigma two." 91. *C. pracax*, Mart. 84. Lam. 31. Jacq. Andl. tab. 446. Gooden. 22. Smith 36. Wahlen. 98. Schkuhr. 59. tab. F. fig. 27. (C. fasciata, Hud. C. montana, Reli. 353. Lightf. 557. Gram. cyp. vernum minimum, Rau syn. 421. Greg. em. 22. Marl. 8 tab. 12. fig. 11.) "Bracteal sheaths nearly as long as the peduncle; spikes egg-shaped, near together; glumes a little mucronate; fruit roundish, pubescent," *Root* creeping, and branching out into several leafy tufts. *Stems* ascending, from three to six inches high, naked, obliquely triangular, smooth. *Leaves* short, rigid, recurved, a little revolute, roughish, especially at the edges. *Bracteas* erect, often wanting; sheaths short, dilated upwards. *Male spike* inversely egg-shaped, rather obtuse; glumes elliptical, of a rusty colour, bluntish; anthers sulphur-coloured. *Female spik es* generally two, near together; on short peduncles, egg-shaped, nearly erect; glumes


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Plumes broad, egg-shaped, rather pointed, of a rufous colour, with a green keel. *Fruit* scarcely the length of the glume, roundish on the showy part, keeled, pubescent, green, brown at the tips. *Stigmas* three. **Seed** white.

A native of dry exposed situations and heaths, flowering in April. 92. C. trifoliae. Mat. 39. Wahlen. 101. Schkuhr tab. W 70, 87. 109. Thumb. 38. "Spikes three, fillicle, linear, male longer. *Female* spikes from Montana, tufted. *Male* spikes three or four, acute; lower one distant from the others, in the axil of a narrow leaf; glumes acute, reddish, with a green keel. Found by Consolario in the Isle of Bourbon. 100. C. Virginitana. (C. helicis. Lam. 35. "Female spikes two, fillicle, erect, with male flowers at the top; male terminal, remote; item naked." Stem about a foot high, slender, compressed above, triangular below, rough. *Leaves* as long as the stem, near two inches broad, flat. *Male* spike terminal, an inch long; glumes oblong, brown with a white edge. **Female** spikes dilated from the male, fillicle, upright, linear, preened close, reddish brown, with some male flowers at the top; lower one with a bracteal leaf as long as the spike. A native of Virginia, Pennsylvania, &c. described by La Marek from a dried specimen. 101. C. stenoptera. 417. Schkuhr tab. 10. fig. 12. "Spikes erect, variegated; male egg-shaped; lower female peduncled, axillary." Stem an inch and half, or two inches high, with three or four short, upright, acute, flaccid-leaved. *Root leaves* dilated, slightly keeled, smooth, about the length of the stem. **Spikes** three or four; male terminal, upright; glumes oval, smooth, mucronate, brown, with a green keel, and a membranous, whitish edge; females upright, obtuse, rounded, covered like the male. A native of mountains in Switzerland. 102. C. alpina. Mart. 77. Alpin. p. 1585. (C. gymnoepis, Villars dauph. 2. 26. Wahlen 99. Schkuhr 50. tab. G. fig. 35. "Lowest female spike radical; fruit triangular, elongated." Stems from three to nine inches high, naked. *Leaves* in tufts, two lines broad, keeled, acuminate, smooth except at the tip. *Spikes* very small; male none long; glumes egg-shaped, obtuse, with a yellow keel and white edge; upper female spike fillicle, an inch below the male, few flowers; bracteal flaccid, awned; lower one with about six flowers, on a peduncle, three inches long or more. There are sometimes, but rarely, three female spikes. A native of Piedmont and Switzerland.

The alpestria of La Marek agrees in some respects with the preceding, but as he has nothing of the great distance of the lower female spike from the others, from which circumstance Villars took his trivial name, it must be a different plant. It was received from the neighbourhood of St. Maurice in the Vaud, and as it gives no synonyms, certainly is notconfined to the Mendocino. We shall call it for the present 103. C. Lamarckii, "Female spikes about three or four; upper ones fillicle; fruit smooth, globular, mucronate." Stem seven or eight inches high, naked, slender, cylindrical, compressed, dilated. *Leaves* in tufts three or four inches long, glaucous, flaccid, smooth. *Spikes* three, or four of a rufous colour; male terminal, half an inch long; nine rather obtuse, membranes at the edges; the upper female spikes short, nearly fillicle, each with a pointed bracteate about its own length; lowest larger, peduncled, in the axil of a very narrow bracteal leaf longer than the spike; glumes egg-shaped, rather blunt, smooth, rufous, membranous and white at the edge. Fruit smooth, almost globular, mucronate. 104. C. tenuifolia. Lam. 52. Poiret. Voyage en Barbary. Vol. 2. p. 254. "Female spikes erect, few-flowered; lower ones dilated on long peduncles; upper ones nearly fillicle; leaves very narrow." Root perennial, creeping, blackish, surrounded at the top with numerous brown filaments. Stems several, six or seven inches high, very slender, triangular, compressed, moderately leaved. *Leaves* very narrow, flaccid smooth, green, keeled, a little folded in at the edges, longer than the stems. *Male* spikes terminal, about half an inch long, upright, oblong, acute, of a rufous colour.

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Female spikes upright, less than the male, few-flowered, of a rufset-green colour, dilant from each other, upper one near the male with a feley bracte; the two others peduncled and axillary; the lowest in a very long, capillary peduncle, which springs almost from the bottom of the stem; glumes egg-shaped, scarcely acute, greenish and fringed on the edges, brown or rufset-coloured at the edge near the tip. The plant of Barbary on moil, elevated ground. This plant is nearly allied to the alpilus of Allioni, but differs in the breadth of the leaves, and colour of the glumes. 105. C. bardeformis, Villars, 72. (C. hartdeformis, Villars, 2. n. 43, tab. 6.)

Spikes very thick; peduncles fleshet; bractes foliaceous, very long; the lowest nearly radical, the others rather near together; fruit egg-shaped, acuminate, somewhat beaked, very convex on one side, a little concave on the other, ferricate at the edges; orifice hid; ligmas three; male spikes two.” A native of Dauphiny. 106. C. pennis, Wahlen. Goop. Schkuhr 69, tab. O. Y, fig. 54. “Spikes thin, oblong, rather many-flowered; peduncles naked; bractes somewhat foliaceous, rather remote; fruits short; fruit oblong, lanceolate, with a flench edge, acutely and finely ferriate at the edges; ligmas three, orifice one-lobed.” A native of the Austrian Alps. 107. C. atrata, Wahlen. 137.

Schkuhr 74. tab. L. fig. 46. “Spikes oval; peduncles naked; bractes foliaceous, dilant; orifice very short; glumes broad-ovate, obtuse, fruit ovate, pointed; orifice obtusely one-lobed; ligmas three; stem acutely angular.” A native of Switzerland. 108. C. ferruginea, Mart. 78. Wahl. 84. Allioni, ped. n. 2333. Scop. Carn. 1150. Hall. helv. 1390. Schuech. 10. 6. (C. alpina, Schrank.)

“Male spike acuminate; female two or three, flender, peduncled; glumes rufset-coloured; fruit bifoem.” Stem half a foot high, pale green. Male spike an inch long, glumes long, narrow, acuminate, rufset-coloured, with a green keel. Female spikes three or four; the first with a short bracte, the second with a leaflet as long as itself, the third with a longer leaflet; glumes green with a rufset-coloured edge; ligmas three. A native of Switzerland. Pedmont, and, if Scopoli be right in thinking his plant the same as Haller’s, of Carnicia, though it is not alpine there as it is in the Grifona. 109. C. sepimentum, Villars dauph. 2. 214. Stems eight or ten inches high, flender, hard. Leaves in tufts, long, hard but flexible, continuing through the winter till the new ones come up when they are completely bleached. Spikes three; male blackish, variegated with grey; female loose, peduncled; glumes blackish-brown with a green keel. Fruit triangular, blackish, smooth, except near the top. Seed triangular, grey, elongated. A native of Dauphiny. Professor Martya gives it as a conjunctival synonym of the preceding, because Villars has referred to Scopoli and Haller with a mark of doubt. 110. C. fedigida, Mart. 79. Wahl. 83. Allioni, ped. 2344. Hall. helv. n. 1391. Villars dauph. 2. 215. (C. variegata; Lam? C. fialingoius, Schkuhr. 76. tab. C. c, fig. 47.) “Female spikes three or four, two-rowed; fruite long, pointed.” Mart. “Spikes three, nearly erect, brown and white; glumes membranous at the tip; fruit acuminate, roughish.” Lam. Stem half a foot high and more, naked. Leaves a line broad or more, smooth, except at the edge. Male spike near an inch long, often fertile at the bottom; glumes sharply lanceolate, shining bay, with a green or yellowish keel. Female spikes axilary, lower ones pendant. Hall. Villars says it differs little from his fenni¬erici. La Marck refers to Haller and Allioni with a mark of doubt. He gives the following description from a dried specimen gathered on the mountains of Dauphiny. Root perennial, strong, with greyish or brown fibres. Stem from seven to ten inches high, flender, naked. Leaves unequal in length, the largest five inches long, and little more than a line broad, fringed, smooth, hard, firm. Male spike terminal, upright, five or six lines long; glumes obtuso; very membranous and white at the top, brown on the back with a whitish line. Female spikes two, peduncled, especially the lowest, short, brown, variegated, pendant when in fruit. Fruit egg-shaped, acute, orifice long, obtuse; leaves somewhat recurved, rigid; fruit rather compressed.” Root perennial, thick, creeping. Stem from three to five inches high, often curved, naked, rigid, acutely triangular; angles rough. Leaves rigid, recurved, rather glaucous, rough at the edges and on the keel. Bractes foliaceous, shorter than the spike, often recurved, arched at the base. Male spike short, egg¬shaped, rather obtuse, thick, rarely two; glumes obtuse, with a delicate greenish keel. Female often three, egg-shaped; two upper ones seifile, near the male, lower rather remote, erect, on a short peduncle; glumes elliptical, obtuse, black, with a white edge and a fine green keel. Fruit longer than the glumes, densely imbricated, elliptical, rather compressed, flatish on one side, smooth, brown outward, sometimes lengthened at the tip, and recurved; orifice always undivided, ligmas two, thickish. On the top of the Snowdon in Wales; Ben Lamond and other mountains in the highlands of Scotland, flowering in June and July. 111. C. brachyphylla. Wahl. 82. Schrank. Schkuhr 83. tab. P. fig. 58. “Spikes on long naked peduncles, very narrow, short, loosely flowered; bractes fleshy, somewhat foliaceous, rather remote; glumes short, somewhat mucronate; fruit lanceolate; orifice two-toothed; ligmas three; stem bristle-shaped; leaves very narrow, convolute.” A native of Switzerland. 112. C. palla, Gooden. Linn. Tran. vol. iii. tab. 17. Smith 29. Wahl. 142. (C. fuccta; Schkuhr. 52. tab. C. c, fig. 88. C. globularis var. Vahl.) “Digynous; bractial seifile none; spikes egg-shaped; lower one peduncled; fruit elliptical-inflected, somewhat beaked, emarginate.” Root perennial, creeping. Stem nearly erect, six or seven inches high, frilled, triangular; angles rough towards the top. Leaves nearly erect, flat, rough at the edge. Bracte foliaceous, embracing the stem feely lanceolate, rather at the edge. Male spike terminal, erect, lanceolate, many-flowered; females often two, remote, egg-shaped, erect; the lower on a long peduncle, the upper on a short peduncle, with a very short spike, often one, peduncle rough; glumes all elliptical-lanceolate, obtuse, blackish brown, with a fine white edge and a faint nerve. Fruit spreading, longer than the glume, elliptical, smooth, not ribbed, pale at the base, blackish brown at the tip, shining. Seed triangular; ligmas two. A native of mountains in the highlands of Scotland, flowering in July. 114. C. pallasii. Linn. Sp. Pl. 29. Mart. 54. Lam. 46. Wahl. 121. Schkuhr 92. tab. K. k, fig. 99 Flor. Dan. 1950. Leers 201. tab. 15. fig. 4. (Gram. cryper. Rai fyn. 146, n. 8. Pluk. Phyt. tab. 34. fig. 5. Mich. gen. 61, tab. 32. fig. 13.) “Bractial seifile very short; spikes cylindrical, peduncled; fruit-bearing ones pendulous; fruit elliptical, inflalted, obtuse.” Root perennial, fibrous. Stem a foot high or more, erect, leafy at the base, triangular; angles rather acute near the top, rough. Leaves flat, pale, somewhat hairy, roughish at the edges. Bracte foliaceous, erect, considerably longer than the stem, with very short seifile. Male spike terminal, lanceolate, erect, dense,
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dense, pale rust-colour; females three, peduncled, fruit erect, afterwards pendulous; peduncles triangular, smooth, and even; glumes egg-shaped, acuminate, yellowish, with a green keel. Fruit the length of the glumes, elliptical, inflated, very obtuse, awnless, without ribs, smooth, pale green. Stigmas three. Seed triangularly-irregularly egg-shaped. A native of moist pastures and woods in England, and other parts of Europe, flowering in May and June. 115. C. echinata, Wallen. 6a. Thumb. in Herbar. "Spikes nearly cylindrical, thick; male club-shaped; bracts sheathing the peduncle, foliaceous, remote; glumes nearly as long as the fruit, mucronate; fruit roundish, oval, gibbous, curved outwards, beaked; stigmas three; leaves very broad." B. C. cylindracea. "Spikes cylindrical, thickish; male several; bracts foliaceous, broad, and long." C. tritica (C. chas. var, Thumb. Prod. p. 14.) "Spikes oval, very thick, male at the top; glumes as long as the fruit, a little cupuliform." A native of the Cape of Good Hope. 116. C. flava, Linn. Sp. Pl. 15. 18, Lam. 28. Wahlen. 61. Eng. Bot. 1294. Flor. Dan. tab. 1647. Leers, tab. 15, fig. 6. (Graham pahure echinatum, Rai Syn. p. 421. n. 18. Ger. Bot. 17. G. cyper. Mor. § 6. tab. 12. fig. 19.) Marsh hedgehog-grass. "Branched spikes short, nearly the length of the peduncles; female spikes roundish; fruit beaked, curved downwards; stem nearly smooth." Root perennial, creeping. Stem often a foot high, erect, leafy below, triangular; angles generally smooth and even, sometimes a little rough. Leaves bright green, erect, rather broad, flat, longer than the stem, rough on the edges and on the keel, marked with two rough lines on their upper side towards the extremity. Breasted foliaceous, much longer than the stem; upper ones spreading, deflexed, with a very short keel; the lowest with a longer keel, ± 1 leaf spreading. Male spike lanceolate, crenate, deflexed, very seldom more than one; female about three, roundish, egg-shaped, spreading; upper ones generally near together, most commonly crenate; lowest more remote, peduncled; peduncle a little shorter than the keel; glumes egg-shaped, tawny, with a green rib. Fruit longer than the glumes, spreading every way, egg-shaped, inflated, smooth, ribbed, crenate, at the tip, triangular; angle not at all rough; stigmas three. Seed small, triangularly-irregularly egg-shaped, black. Common in boggy meadows, flowering in May and June. 117. C. obtusa, Oeder, Roth, Hoffmann. Ehrh. Wildt. Schkuhr 35. tab. f. (C. flava, & flavecens, Wahlen. C. extensa, Reih. Flor. Cant.) "Bracts rather dilated; fruit oblong-irregularly egg-shaped, a little inflated, with a short awl-shaped beak, not recurved; orifice two-toothed; stem softly angular; leaves narrow, the lower ones the longest, incurved at the edges." Wahlen. Common near Yarmouth. Mr. Dawson Turner observes (Icet Botanists Guide, vol. ii. p. 75.), that he can find no satisfactory marks of distinction between this and the preceding species, and yet it is so constant in its appearance, in all situations, whether wet or dry, that though Schkuhr is inclined to consider it only as a variety of flava, he cannot but believe it distinct. He adds, that Mr. Brunton pointed out to Dr. Smith the same leading distinction as was noticed by Dr. Roth, the fruit expanding in all directions, and not at all recurved. Mr. Turner supposes that it has been mistaken by many Botanists for the much more rare C. extensa. 118. C. exsetosa, Mart. 80. Gooden. 25. Linn. Trans. vol. ii. tab. 21. fig. 7. Smith 33. Wahlen. 65. Eng. Bot. 833. Sch. tab. X. x. fig. 72. (Cyperoideae echinatum majus, Dill. in Rai Syn. 421.) "Breasted leaves and peduncles very short; bracts very long; female spikes roundish; fruit egg-shaped; stem smooth." Root perennial, fibrous. Stem near a foot high, erect, or ascending, sometimes curved, obscurely trig.
half long; glumes densely imbricated, elliptical, obtuse, with a short point, blackish; keel sharp, green. *Trianthema* three or four, rarely five, cylindric, erect; lower ones very remote, on longer peduncles, and often compound or branched at the base; all of them sometimes with male flowers at the top; glumes egg-shaped, black, pointed; keel green, smooth, except at the point. Fruit longer than the glumes, egg-shaped, scarcely beaked, smooth, thinning, purplish within and at the tip, pale without, with two principal green ribs, besides several small ones running longitudinally at some distance from the margin; figmas three. Common in many parts of England and Scotland, but not generally undersown, flowering in June. 122. *C. palaestina*, wall. *C. palaestina* Schkuhr, tab. S. fig. 67. "Spikes broad lanceolate; peduncles fleshy; bract long, foliaceous, lower ones very remote; sheaths short; fruit oblong, with a long acuminate beak, convex on one side, a little concave on the other, prefoliate, ciliate at the edges, orifice bifid; figmas three." A native of Austria. 123. *C. betaeferma*, Wahlen. 67. "Spikes somewhat thread-shaped, straight; flowers scattered; peduncles fleshy; bracts foliaceous, long, remote; fruit oval-ventricose, elongated at the base, attenuated at the top, curved outwards; orifice quite entire; figmas three." A native of North America. 124. C. jucunda, Mart. 91. Scop. Carn. v. 1163. Mich. Gen. 55. n. 19. "Spikes very remote; male longer than the females, which are nearly fleshy; fruit brown, triangular, smooth; seed triangular." Stem a foot high. Leaves scarcely two lines broad. Upper female spike sometimes with male flowers at the tip; lower with a leaf longer than the spike. 125. *C. flava*, linn. Sp. Pl 39. Mart. 35. Lam. 57. Wahlen. 96. Schkuhr 92. tab. I. 1 fig. 170. Eng. Bot. 1705. "Sheaths elongated, about half the length of the peduncles; female spikes rather loose, dilate; fruit inflated; orifice smooth." *Root perennial, creeping. Stem from 2 to 4 inches high, erect, obtusely triangular, smooth. Leaves glaucous, short, rather erect, rough at the edges and top of the keel.* Bracte foliaceous, acute, shorter than the stem; sheaths long, furrowed, pale, or yellowish. *Male spikes* one or two, lanceolate, acute, denser; glumes rusty brown, obtuse, various in breadth, with a green keel. *Female spikes* generally two, sometimes with male flowers at the top, remote, erect, on slender peduncles twice as long as the sheaths; glumes loosely imbricated, egg-shaped, finely brown, acute, awnless, membranous at the edge, with a green keel; figmas three. Fruit egg shaped, longer than the glumes, inflated, blunted, entire, smooth, obscurely ribbed, of a light greenish, or yellowish hue. *Seed short, triangular, brown, frequently inflected with the diacate called filament, which turns it into footy dust.* Dr. Smith. A native of moist ground, flowering in May and June. 126. *C. recurvata*, Mart. 70. Hudson p. 413. 2 Ed. Flor. Dan. 105. Eng. bot. 1536. (C. glauca; Scop. Carn. v. 2. 223. Polich v. 2. 164. C. limbata B; Leers 201. tab. 15 fig. 3. C. flava; Wahlen. 157. Schreb. Schkuhr 98. tab. O. P. ag. 57. a-b. Gram. cyp. folis cariosphilis, spicis pendulis in Ral Syn. p. 418. n. 5. Morif. § 8. tab. 12. fig. 14.) "Sheaths short; female spikes cylindrical, pendulous; fruit elliptical, triangular, roughish; root creeping." *Root perennial, sheathed with brown scales. Whole herb glaucous. Stem from eight to eighteen inches high, erect, convexly triangular, rough upwards. Leaves shorter than the stem, erect, broad, flat, rough-edged. *Bracte foliaceous, erect, nearly as long as the stem; sheaths short, with a small appendage on each side.* Male spikes various, mostly solitary, sometimes two perfectly distinct and both peduncled, when solitary often compound, with one or two spikellets, sessile at its base; glumes imbricated, egg-shaped, blunt, brown, a little pale keel. *Female spikes* two or three; sometimes with male flowers at the top, the upper ones sometimes nearly sessile, the next on a long peduncle, the lowest often on a very long one springing from the very bottom of the stem, all at first erect, afterwards pendulous, cylindric, very dense; glumes egg-shaped, some what pointed, blackish, with a white edge and yellowish nerve; figmas three. Fruit imbricated, elliptical, bluntly triangular, swelling, entire, more or less downy or rough, of a rusty green, soon becoming black. *Seed short, triangular; common on moist ground, flowering in May and June. 127. *C. palaestina*, wall. 152. (C. atrofasciata; Schkuhr 92. tab. V. fig. 82.) "Spikes peduncled; peduncles naked, curved backwards; bracts loosely sheathing, finely foliaceous, dilute; fruit oval, acuminate, flattish on both sides, acutely angular, beaked, black; orifice two-toothed; figmas three; male spike oblong, recurved. A native of mountains in Sweden, and Iceland. 128. *C. latijuga*, Wahlen. 94. Schkuhr 98. tab. M. fig. 49. "Spikes very narrow, rather looselyflowered; peduncles partly naked; bracts closely foliaceous, remote; sheaths very long; fruit elongated-egg-shaped, triangular, curved outwards at the tip, quite entire; figmas three, leaves very broad. A native of Virginia, in the herbarium of Thunberg. 129. *C. palaestina*, Wahlen. 93. Schkuhr 78. tab. M. fig. 49. "Spikes linear, looselyflowered; peduncles naked; bracts sheathing, foliaceous, remote; fruit somewhat oval, acutest; orifice transparent, two-leaved; figmas three; leaves ciliate." A native of Moravia, in the herbarium of C. limi. 130. *C. limi*, Linn. Sp. Pl. 27. Mart. 32. Lam. 45. 3. Smith 27. Gouden 24. Wahlen. 122. Schkuhr tab. T. fig. 107. flora Dan. 646. (Cyperoids spica pendula, lacerata, glumis apicem vel inciso rutilante variata; Schiffiz. Acta. 443. tab. 13. fig. 13.) "Sheaths very short, linear, acute; female spikes egg-shaped, pendulous; fruit elliptical, compressef; root creeping." Dr. Smith. *Root perennial, throwing out suckers; foliage cloathed with a thick down. Whole herb rather glaucous. Stems ascending, a foot high, triangular, frayed, rough, lax, at the base. Leaves linear, narrow, flat, shorter than the stem, rough at the edges, sheathed at the base with brown scales. Bracts erect, resembling the leaves but smaller; sheaths brown, slightly margined, membraneous and white at the edge. Male spike terminal, erect, lanceolate, reddish brown; glumes egg-shaped, acute. Female one or two, peduncled, drooping, finally pendulous. Egg shaped, many-flowered, dense, hand-like; glumes broadly elliptical, somewhat pointed, green at the back, deep green-coloured at the edge; peduncles very long, triangular, smooth. Fruit imbricated, a little longer than the glumes, elliptical, compressef, ribbed, smooth, entire, scarcely beaked; figmas three. Seed elliptical, triangular, a little compressef, brown. A native of dry boggy places in England, and other parts of Europe. 132. *C. leucophaea*. Wahlen. 95. "Spikes oblong-elliptical, rather slender, shorter than the flowered, pendulous; peduncles naked; bracts foliaceous, rather narrow; remort sheaths rather long; glumes obtuse, as long as the fruit; fruit oblong-elliptical, rather obtuse, triangular, compressed; orifice obtuse orifice very entire; figmas three; stem fuscous. A native of the turfy borders of lakes in Lapland. Female spikes similar to those of the preceding species. 150. *C. capitoja*, Linn. Sp. Plan. 34. Mart. 38. Smith 42. Wahlen. 139. Eng. bot. 1507. Schkuhr 48. tab. B. fig. 8. c. d. (Grann. Caryophyllichum; Dill. in Ral Syn. p. 418. n. 6.) "Dygnous; bracteae arudi, not theiling; spikes fuscous, cylindrical, obfute; fruit permanent." Root creeping, but short, forming
forming dense, entangled tufts. Stems from nine to twelve inches high, erect, acutely triangular, roughish upwards. Leaves erect, almost as tall as the stem, narrow, acute, of a bright not glaucous green, rough at the edges and keel. Bracteae like the leaves, but much smaller, without any sheath, accompanied at the base by a pair of round black aliciae, which are largest in the smaller bracteae. male spikes almost always solitary, lanceolate, erect; glumes brown, obtuse, unnarrowed, with a green nerve. Female spikes two or three; crowded, sessile, erect, cylindrical, floribund, obtuse; glumes elliptical, obtuse, close, black, with a green nerve. Fruit elliptical, broad, compressed, ribbed, green, smooth, permanent after it is ripe; fLigmas two. Seed compressed. Dr. Smith. A native of moist ground in Sweden and England. 133. C. frutica, Mart. 83. Gooden. 140. Lindl. Trans. V. 2. tab. 21. fig. 9. Smith 43. Wahlen. 38. Schlüchtern 49. tab. V. fig. 73. (C. cypelata; Huds. p. 412. Lightf. 561. B. C. acuta, and Leers 204. tab. 16. fig. 1. Hult. hyl. n. 1450. on the authority of Davall. C. chata; Mart. 86. Allion. pedem. n. 2344. Gram. cyper. Rari syn. p. 418. n. 4. Locl. Trans. 116. tab. 30.) "Diggins; bracteae slightly auricled, not fleating; spikes nearly sessile, cylindrical, elongated, acute; fruit deciduous." Root perennial, creeping. Whole herb rather glaucous, double the size of the preceding. Stem about two feet high, erect, sharply triangular; rough upwards. Leaves erect, longer than the stem, rough on the edges and keel; nut-leaves embracing the stem, with the feathers split into threads after the manner of open network. Bracteae similar to the leaves, sessile, erect, straight, accompanied at the base by two oblong aliciae which soon dis-appear; sheath none. Spikes on short peduncles, erect, an inch and half or two inches long, linear-lanceolate, rather narrow, very dense, many-flowered; all the glumes elliptic-lanceolate, obtuse, pruinose, close, black, with a green nerve; male spikes often two; females generally three, often with male flowers at the top; ligmas two. Fruit imbricated, egg-shaped, acute, compressed, ribbed, green, smooth, deciduous as soon as ripe. Seed similar to that of the preceding species. A native of marshy places in various parts of Europe. 134. C. japonica, Mart. 40. Lindl. 51. Thunb. flor. japon. 58. "Spikes monocious, peduncled, erect; female ones peduncled, egg-shaped; male terminal, linear." Root fibrous. Stem about seven inches high, leafy, triangular, erect, weak, smooth. Leaves alternate, fleating, smooth, erect; lower ones shorter than the stem; upper ones over-tapping it. Male spikes terminal, linear, longer than the others. Female spikes two or three, erect, egg-shaped, furnished with bracteae. A native of the island of Nippon, flowering in June. L. Marte. judges observes, that from this description the spikes are improperly said to be monocious. 135. C. planginacea, Lam. 49. "Male spike short, dark purple; female spike remote, erect, slender; stem sheathed, leaves ribbed." Root-leaves in thick tufts, oblong-lanceolate, flat, about an inch broad, ribbed like theophant, purple at their base. Stem slender, straight, jointed, higher than the leaves, and furnished in all their length with numerous alternate, naked, pointed, purple fleathes, of which only the lower terminate in short leaves. Male spike more than half an inch long, terminal, oblong-egg-shaped, straight, nearly black or dark purple; glumes smooth, oblong-egg-shaped. Female spikes four or five, straight, very slender, distant from each other, on short peduncles which are partly concealed by the sheath; glumes loosely imbricated, smooth, membranous, acuminate, purplish at the tip. Supposed to be a native of South America; cultivated in the open air at Paris, where it flowers early in the spring. 136. C. hispida, Lam. 54. "Female spikes hispid, axillary, erect; flowers dilated; leaves flat." Stem in a tuft, from five to nine inches high, leafy. Leaves alternate, flattened, flat, like those of junco, plano- smooth, two or three lines broad; root-leaves shorter than the others. Male spike terminal, bright, pale or yellowish, scarcely an inch long; glumes lanceolate-egg-shaped, recurved. Female spikes three, an inch long, alternate, axillary, bright, bluish, peduncled; glumes alternately, dilated, mucronate, membranous, white. A native of New York, Pennsylvania, and Virginia. 137. C. fragrans, Wahlen. 118. "Spikes on rather short peduncles, linear, elongated at the base, loose; bracteae partly embracing the stem, foliaceous, rather dilated; glumes ovate, elliptical, mucronate; fruit oblong, depressed, pointed, orifice two-toothed; ligmas three; stem acutely angular." A native of North America. 138. C. lomana, Wahlen. 142. "Spikes peduncled, slender, and tapering, zig-zag, nodding; bracteae partly embracing the stem, foliaceous, dilated, very long; glumes with a long diverging awn, fruit somewhat globular, pointed; orifice quite entire; ligmas three." A native of Pennsylvania. 139. C. oblongifolia, Wahlen. 86. Mart. 93. Lam. 54. Retz. Obs. Fafe. iii. p. 42. "Spikes erect; male terminal; female four, peduncled; fruit acuminate." Stem seven or eight inches high, triangular, smooth. Leaves longer than the stem, rough at the edges. Female spikes resembling those of the next species, but are upright, remote, foliaceous, more slender, and are each furnished with a slender bracteae nearly the length of the spike. A native of China. 140. C. pseudocyperus, Lam. Sp. Pl. 32. Mart. 37. Lam. 53. Wahlen. 117. Smith. Engl. Bot. tab. 152. Selkirk 25. tab. M m. fig. 122. (Gram. Cyper. p. 419. n. 12. Moris. $8. tab. 12. fig. 5.) "Bracteae scarcely fleating; spikes cylindrical, pendulous, many-flowered; fruit spreading, surrowed, beaked, cloven." Root perennial, fibrous. Stem a foot high or more, erect, leathyr, sharply triangular; rough at the angles. Leaves pale green, fleating, rising, rough above, and at the edges. Bracteae less than the leaves, and scarcely fleating. Pedicels very long, triangular, slender, rough, sometimes two from a bracteae. Spikes cyndrical, many-flowered, dense; male erect, red; female about four, on peduncles about their own length, greenish, at first erect, but soon pendulous; glumes egg-shaped, with long, very rough awns. Fruit spreading, lanceolate, triangular, ribsbed, smooth, beaked, cloven; ligmas three. Seed elliptical, triangular, white. Not very uncommon in wet shady places, flowering in June. 141. C. cymata, Lam. 55. "Spikes long, bristy, rather pendulous; glumes bristy, several times longer than the fruit." Stem about two feet high, triangular, leafy. Leaves fluated, long, three or four lines broad: upper stem one, longer than the stem. Spikes about five; male an inch and an half long, terminal, linear, with sometimes a few female flowers at the base; glumes narrow, linear-angle-shaped, yellowish or reddish; females near three inches long, alternate, axillary, peduncled, drooping; glumes very narrow, linear-bristle-shaped, ciliated, spreading, much longer than the fruit. Fruit roundish-egg-shaped, smooth, angular, slightly mucronate. A native of Virginia. 142. C. miceliss, Wahlen. 89. Hoff. Schkuhr 84. tab. p. and V v. ffi. 59. (C. ampalacea, Wulfen.) "Spikes thickish, short; peduncles sheathed; bracteae somewhat foliaceous, rather remote; glumes acuminate, as long as the fruit; fruit broad, inversely egg-shaped, with a rather long bicuspidate beak; ligmas three." A native of Moravia. 143. C. san-ophylu, Wahlen. 73. "Spikes fix-flowered, very thick; peduncles somewhat sheathed; bracteae foliaceous, very res-
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The fruit is oblong-conical, inflated, beaked, diverging; orifice bifiid; ligilias three. A native of North America. 144. C. foliulata, Linn. 51. Mart. 36. Wahlen. 74. Schkuhr 73. tab. N. fig. 52. Linn. Transv. vol. vii. tab. 9. fig. 4. (Gram. Cyp. Plk. Mart. 96. tab. 419. fig. 1.) "Spikes terminal, peduncled, male and female; fruit awl-shaped, the length of the spike." Stem two feet high, triangular. Leaves narrow. Male spike terminal, oblong, peduncled, accompanied in the fimple axil by a female spike, consisting of seven or eight conic-awl-shaped, spreading, seed-vessels each as long as the spike itself, big with the seed, Linn. The figure in the Linnaean Transactions, taken from a specimen in the possession of Mr. Rudge, and corresponding with one in the herbarium of Sir Joseph Banks, has two female spikes, as has also Pluknet's figure, quoted by Linnaeus. Found by Kalm in Canada. 145. C. iutaeformis, Rudge in Linn. Transv. vol. vii. p. 97. tab. 9. fig. 3. (C. foliulata, Linn. 48? C. lurida, Wahlen.) "Female spikes few-flowered; fruit inflated, egg-shaped, with a long pointed beak." Stem erect, triangular; angles rather obtuse, smooth, but rough above the lower bracte. Leaves longer than the stem, broad, dark green, rough at the edges and on the keel. Male spikes terminal, linear, on a long peduncle. Female spikes with loosely imbricated flowers on very short peduncles; glumes oblong-egg-shaped, acute, half the length of the fruit. Fruit oblong-egg-shaped, much inflated, erect, fruited, with a long acute beak, cloven at the orifice; ligilias three. Styles egg-shaped, triangular, smooth, acuminate, yellow. A native of Carolina. 146. C. pendula, Linn. 57. Huth. p. 411. Gooden. 20. Smith 21. Curtis Flox. Lond. tab. 63. Schkuhr 85. tab. Q. fig. 60. (C. agallachys, Linn. jun. Supp. 414. Ehrl. Phyt. n. 19. Wahlen. 76. C. maxima, Linn. 56. Scop. Carnii. n. 1166. Allion. Flor. Ped. n. 241. Hall. Helv. n. 136. Gram. Cyper. Rni. Syn. p. 420. n. 15. Morif. § 8. tab. 12. fig. 4. Barel. Icon. tab. 45.) "Sheaths elongated, nearly the length of the peduncle; spikes cylindricl, very long, nodding; fruit crowded, egg-shaped, acute." Root perennial, fibrous. Stem from three to fix feet high, erect, firm, leafy, smooth, triangular; angles roughish towards the top. Leaves broad, deep green, rigid, hard, rough at the edges and on the keel, rather glaucous underneath. Breaks foliaceous; lower ones very long, hanging down in a curve, sheathing; sheaths nearly the length of the peduncles. Spikes from five to seven, peduncled, curvilinearly pendulous, cylindrical, many-flowered, very dense; the highest male, sometimes with female flowers at the top; the rest commonly female; glumes lanceolate, acuminate, brown, with a green keel. Fruit egg-shaped, triangular, rather inflated, smooth, beaked, at length emarginate; ligilias three. Seed triangular, brown. A native of woods and moist hedges in many parts of Europe, flowering in May and June. 147. C. virgata, Mart. 88. Huth. p. 411. Gooden. 21. Smith 22. Eng. Bot. 994. Schkuhr 30. tab. N. fig. 53. (C. leptofolchys, Mart. 92. Linn. Supp. 414. Ehrl. Phyt. n. 48. Wahlen. 68. Gram. Cyper. Rni. Syn. p. 419. n. 11.) "Sheaths elongated, nearly equal to the peduncle; spikes filiform, loose, a little drooping; fruit lanceolate, triangular, ribbed." Root perennial, fibrous. Stem two feet high, erect, slender, leafy, triangular, smooth. Leaves light green, broad, thin, rough on the edges and keel. Breaks like the leaves, shorter than the stem; sheath nearly as long as the peduncle, crowned by a tabular membrane. Spikes fix or eight, peduncled; the highest male, the red female; glumes lanceolate, greenish. Fruit lanceolate, triangular, acute, ribbed, smooth, green, ligilias three. Seed elliptic, triangular. A native of woods and hedges in several parts of England, but not common, flowering in April and May. 148. C. flexuatica, Mart. 89. Huth. p. 411. Gooden. 31. Smith 23. Flor. Dan. 424. Eng. Bot. 995. Schkuhr 94. tab. L. fig. 141. (C. veleria, 2 Sp. Pl. C. diymea, Linn. jun. Supp. p. 414. Ehrl. Phyt. n. 58. Wahlen. 79. C. patula, Linn. 45. Pollieh. vi. ii. 557. C. capillaris, Lcrs 202. tab. 15. fig. 2. Hall. Helv. n. 1395. Gram. Cyper. Rni. Syn. p. 419. n. 10. Morif. § 8. tab. 12. fig. 9.) "Sheaths half the length of the peduncle; spikes slender, a little loofe, drooping; fruit egg-shaped, triangular, beaked." Root perennial, fibrous. Stem two or three feet high, erect, leafy, smooth, convexly triangular. Leaves bright green, rough above, very rough on the edges and keel. Breaks like the leaves, with longer sheaths. Spikes fix or eight, from drooping, slender, rather loofe; one, rarely two, male; all with flender peduncles more than half the length of the sheath; glumes egg-shaped, acuminate, membranous, white, with a rough green keel. Fruit egg-shaped, triangular, with a long beak, smooth, emarginate at the tip; ligilias three. Seed triangular, brown. It is distinguished from the preceding by the strucrure of its fruit, which has three prominent angles, but no intermediate ribs, and ends in a long cloven beak. Linneaus made it only a variety, and has celebrated its utility to the Laplanders, who use it eated and dressed as a redding to protect them from cold. Common in woods and thickets, flowering in May or June. 149. C. elongata, Mart. 85. Gooden. 32. Wahlen. 86. Smith 24. Eng. Bot. 1098. (C. ventriccosa, Curt. Flor. Lond. tab. 68. C. triifora, Wild. Phytog. tab. 1. fig. 2. Cyperorides, Morif. tab. 32. fig. 5. C. veit ceanum humile, loculusaria, Tour. infl. 130. confirmed by his herbarium.) "Sheaths much shorter than the peduncles; female spikes dilant. erect, five-flowered; fruit inflated, beaked." Root perennial, fibrous. Stem a foot and half high, erect, leafy, obliquely triangular, fruited, smooth. Leaves with long sheaths, pale green, rough on the edges and keel. Breaks like the leaves, but with shorter sheaths which closely unfold the slender peduncles of the female spikes, sometimes for a third part of their length, and sometimes for more than half. Male spike terminal, erect, many-flowered, linear, closely imbricated; glumes elliptical, ruf-coloured, with a white membranous edge and a green keel. Female spikes from three to five, remote, loofe, erect; peduncles triangular, rough; flowers from two to four or five; erect; glumes involute, beaked, pointed, with a green keel. Fruit egg-shaped, triangular, ribbed, smooth, rather long-beaked, with a membranous nearly entire orifice, finally becoming inflated; ligilias three. Seed inversely egg-shaped, triangular. A native of woods but rare, flowering in May and June. 150. C. griffii, Wahlen. 129. "Spikes on naked peduncles, with fix loosely-set flowers; bristles sheathing, long, foliaceous, very remote; glumes cuspidate; fruit oblong-oval, triangular, rather acute; orifice quite entire; ligilias three. Native country unknown; preferred in the herbarium of Swartz. 151. C. caseacea, Wahlen. 87. Suter Flor. helv. 2. n. 57. Schkuhr tab. B b. fig. 117. "Spikes two-flowered at the base, male at the top; peduncles long, naked, flacid; bristles sheathing, long, foliaceous, remote; the lowest radical; fruit broad, inversely egg-shaped, roundish, ending in a point; ligilias three; male spike flacid; leaves narrow." A native of Switzerland. 152. C. capillaris, Linn. Sp. Pl. 28. Mart. 33. Lam. 44. Smith 25. Wahlen. 91. Schkuhr 82. tab. O. fig. 58. Flor. Dan. 168. Scop. Carn. tab. 59. (Cyperorides alpinum; Séguyer. Veron. vol. 3. tab. 3. fig. 1.) "Sheaths half the length of the peduncles; female spike egg-shaped, rather
rather loose, drooping: fruit acuminate. Root perennial, fibrous. Stem erect, from three to five inches high, roundish, slender, filiform, smooth. Root leaves sometimes not half the length of the stem, narrow, acute, flatish, rough on the edges towards the tip. Male spikes erect, linear, of a silvery-brown colour, with about ten flowers. Female spikes two or three, nodding or pendulous, egg-shaped, brown, with fewer flowers; all the glumes egg-shaped, brown, membranous and white at the tip. In an early stage of the inflorescence, all the spikes seem to proceed almost in an umbellate form from the sheath of a common bract each leaf which involves half the length of the peduncles; but as the fruitification advances, the stem elongates and each appears with its proper, but flatter, bracteal leaf and sheath. In this state it is figured in Flora Danica. Fruit egg-shaped, triangular, acuminate, a little inflated; ligaments three. Seed elliptical, acutely triangular. A native of mountains in Scotland and other parts of Europe. flowering in July and August. 153. C. exilis, Wahlen. p. 59. "Spikes thickish, short, rather densely flowered; peduncles long, naked, curved backwards; bracts loosely sheathing, foliaceous, dilated; glumes short; fruit oblong, attenuated, somewhat diverging; orifice oblongated; ligaments three; leaves hairy." A native of North America, preferred in the herbarium of Turner. 154. C. flexilis, Rudge. Linn. Tran. vol. 7. p. 98. Tab. 10. fig. 1. "Female spikes oblong-egg-shaped, pendulous; fruit egg-shaped, beaks acuminate." Stem flexilis, triangular, smooth. Leaves shorter than the stem, erect, thin, hairy at the edges and on the base. Male spike near an inch long, terminal, erect, slender. Female spikes three or four, on long peduncles, oblong-egg-shaped, finally pendulous, two near the summit of the stem; the others remote with longer bracteal leaves; glumes shorter than the fruit, egg-shaped, acute, hairy at the edge. Fruit oblong-egg-shaped, beaked, cloaked; ligaments three, glabrous. Seeds egg-shaped, triangular, smooth. A native of Newfound-land. 155. C. flexilis, Rudge in Linn. Transf. vol. 7. p. 97. tab. 9. fig. 2.) "Female spikes filiform, loose, pendulous; fruit oblong, with a long-pointed beak." Stem slender, filiform, triangular, angles not rough. Leaves longer than the stem, pale green, laciniate at the edge. Male spike terminal, erect, linear. Female spikes zigzag, about four, three near the top of the stem, the other remote; peduncles capillary; glumes oblong, smooth, acute, half the length of the fruit. Fruit oblong, with a long, slender, cloaked beak; ligaments three. 156. C. acuta, Linn. Sp. Pl. 75. Mart. 41. Gooden. 43. Smith 44. Wahlen. 136. Schkuhr 52. F. t. 52. b. (C. gracilis, Curt. Flor. Lond. tab. 6. - Mart. 96. C. verna x Lam? Gram. cyperoidaes majus angulifolium; Rai Syn. p. 417. n. 2.) "Digynous, spikes filiform; drooping in flower, erect in fruit; fruit elliptical, obtuse, entire at the orifice." Root perennial, creeping far. Stem varying in length with the moisture of the situation, sometimes two feet high and more, drooping at the summit when in flower, afterwards becoming erect, acutely triangular; angles rough. Leaves bright green, erect, curved near the tip, rough on the edges and keel. Spikes nearly feathery, filiform, slender, elongated, dense, many-flowered; glumes oblong, acute, awnless, black with a white nerve; male spikes two or three; female three or four, often with female flowers at the top, the lower ones at length becoming peduncled; ligaments two, white. Fruit infertile, elliptical, obtuse, compressed, ribbed, green, smooth, deciduous. Seed small, inversely egg-shaped, double-keeled, not triangular. Common on the banks of ditches and rivers, flowering in May. 157. C. pubescens, Gooden. 43. Smith 45. Eng. bot. 827. Wahlen. 127. Schkuhr 52. Vol. VI.
short, glumes Smith watery Linn. linear—yellow 19. males fruit heaths scales. Fruit 168. female May. the Scotland fig. of Morif. heaths Hulming has Lam. thofe tall fheathlis Common females fig. linear, Eng. Female 83.) fig. males its long Wahlen. figmas Smith fig. Eng. 

Spikes cylindrical, female one peduncled; sheaths very long; glumes pointed; fruit triangular, with a cloven beak.”

Root perennial, creeping. Stem erect, sometimes two feet high, triangular; angles smooth below, rough above the lowest spike. Leaves erect, narrow, glaucous, acute, rough at the edges and on the keel near the tip. Bractes foliacious, erect, narrow, the lowest often overlapping the flem; sheaths none. Male spikes two or three. rather remote, filiform, acute; glumes elliptic-lanceolate, blunt, brown, membranous at the edge, with a yellow keel. Female spikes two, rarely three, more than twice as long as those of veficaria, and much more flender, blunt, lower ones on short peduncles; glumes more acute than those of the male; figmas three. Fruit imbricated, spreading, longer than the glumes, almost globular, inflated, ribbed, smooth, yellowish, with a linear cloven beak. Seed small, elliptical, triangular, fellite, tipped with the long style. Common in Scotland and the northern countries, more rare in the south, flowering in May. 167. C. rostrulata, Wahlen. 75. (C. globularis, Vahl. Schkuhr 71. tab. G. fig. 93.) “Spikes on the peduncles, oval; bractes somewhat foliacious, dilatant; sheaths very short; glumes nearly as long as the fruit, obtuse; fruit somewhat globular, shining, acuminate, somewhat two-lipped; figmas three; flem round; leaves convoluted.” A native of sub-Alpine mountains in Lapland. 166. C. puri-

mala, Mart. 44. Lam. 43. (Wahlen. 71. Thumb. Flor. Jap. 59. Schkuhr tab. Y y. fig. 112.) “Male spikes two, terminal, fellite; female two, peduncled, oblong, erect.” Stem very short, scarcely any. Leaves linear, attenuated, convolute, smooth. Male spikes linear; the lower one half the length of the other. Female spikes smooth. Fruit smooth, inflated, egg-shaped, beaked; figmas three. Scarcely to be distinguished from C. veficaria, except by its almost total want of a flem, the spikes appearing to rise directly from the surface of the ground. A native of Japan. 167. C. birta, Linn. Sp. Pl. 37. Mart. 43. Lam. 61. Wahlen. 70. Smith 51. Eng. bot. 685. Schkuhr 105. tab. U. fig. 108. (Gram. cyper. Rai Syn. p. 418. n. 7. Morif. tab. 12. fig. 10.) “Hairy; spikes short, cylindrical, remote, sheaths nearly as long as the peduncle; glumes awned; fruit hairy.” Root perennial, creeping far, with downy fibres. Stem about two feet high, acutely triangular; angles rough. Leaves scarcely so tall as the flem, erect, flat, acuminate, more hairy underneath, rough at the edges; sheaths long, generally very hairy upwards, but in watery places they sometimes become smooth. Bracte like the leaves, as long as the flem; sheaths hairy, including nearly the whole peduncle. Male spikes two, rather remote, unequal in size, lanceolate; glumes egg-shaped, pointed, brown, hairy on the outside, with a yellow keel. Female spikes three, remote, peduncled, erect, cylindrical, short; rather loofe; glumes smooth, egg-shaped, with long awns, a broad membranous white edge and green keel. Fruit loosely imbricated, egg-shaped, acute, ribbed, hairy on both fides, somewhat beaked, deeply cloven; figmas three. Seed unevenly egg-shaped, triangular, tipped with the permanent style. Common in marshy ground; flowering in May and June. 168. C. fajfeiculata, Wahlen. 128. Link Flor. Luf. Schkuhr 99. tab. Z z. fig. 114. “Spikes nearly fellite, linear; males several; bractes partly embracing the flem, foliacious, long; glumes elliptical, long; fruit oval, beaked, cloven at the edges; orifice somewhat divided;
C A R

figmas three." A native of Portugal. 169. C. fliformis, Linn. Sp. Pl. 23. Mart. 27. Smith. 52. Wahlen. 77. Schkuhr (6), tab. K. fig. 43. (C. tomentosa, Linn. fid. Flora. 5. hirta, Flor. dan. tab. 570. exclusive of the separate spicke, which is C. hirta.) "Spikes egg-shaped; sheaths nearly as long as the peduncles; glumes pointed; fruit downy; leaves channelled, smooth." Root perennial, creeping. Whole herb smooth. Stem two feet high, erect, slender, round, smooth, ruff-like, except towards the top, where it often has three rough angles. Leaves upright, straight, narrow, channelled, without any sharp keel, pointed, rough at the edge. Bracteae like the leaves, overlapping the stem; sheaths short, but nearly as long as the peduncles, serried by small auricles. Male spikes two, rarely one, rather remote, unequal in size, lanceolate; glumes elliptic-oblong, rather acute, blackish, with a yellow nerve. Female spikes two, rarely one, rather remote, egg-shaped, erect; glumes like those of the male, but often slightly awned, smooth. Fruit imbricated, egg-shaped, ribbed, blackish, clothed with short, tawny down, ending in a short, close bead; figmas three. Seed elliptical, triangular, terminated by the short style. Dr. Smith, to whom we are almost entirely indebted for the specific characters and descriptions of all the British species. A native of England and Scotland, but rather rare, flowering in June. 170. C. gigantea, Rudge in Linn. Trans. vol. vi. p. 590. "Male spikes round, erect; females larger, turgid, fruit inflated, glom- bular, beaked, acuminate, spreading." Stem erect, tri- angular, smooth. Leaves broad, dark green much longer than the stem, bifid at the edges and on the keel, ribbed; spaces between the ribs knotty. Male spikes three; two upper ones near together; lower one more dilatant; glumes deeply imbricated. Female spikes three, far exceeding in size those of every other species; the upper one a little incurved, fiddle; the others alternate, pendulous, pendulous; flowers loosely imbricated, divaricated; glumes oblong-egg-shaped, awned, keeled, white and tender at the edge, half as long as the fruit. Fruit globular, much inflated, fritated, loosely imbricated, divaricated, beaked with a long awn; orifice with two teeth; figmas three; seed triangular, smooth. A native of Carolina. 171. C. paniculata, Wahlen. 131. Schreb. in Muhlen. Aéf. Amenc. "Spikes cylindrical; males se- veral; peduncles long, reclinat; bracteae partly embracing the stem, foliacces, dilatant; glumes terminated by a long serrated point; fruit roundish, pointed; orifice emarginate; figmas two; stem lax." A native of North America. 172. C. maritima, Wahlen. 132. Flor. dan. tab. 704. Schkuhr tab. W. fig. 74. "Spikes on long peduncles, pendulous, cylindrical; males several; bracteae partly embracing the stem, foliacces, dilatant; glumes with long points; fruit nearly orbicular, pointed; orifice emarginate; figmas two; leaves broadish." A native of the sea coast in Norway. 173. C. suspidata, Wahlen. 133. "Spikes on short peduncles, oblong-cylindrical; bracteae partly embracing the stem, foliacces, somewhat dilatant, remote from the male spike; glumes with rather long points; fruit somewhat orbicular, pointed; orifice emarginate; figmas two; leaves soft, a little incurved at the edges." A native of muddy shores in Norway. 174. C. rauben, Wahlen. 134. "Spikes on short peduncles, oblong-cylindrical; bracteae partly embracing the stem, foliacces, rather remote; fruit somewhat orbicular, rather large, pointed; orifice emarginate; figmas two; leaves soft, incurved at the edges; stem very long, nearly as equal in length to the sea-coast of Norway. 175. C. aquatica, Wahlen. 135. "Spikes on short peduncles, somewhat linear, thickened and club-shaped above; bracteae partly embracing the stem, foliacces, long, rather remote; fruit somewhat punctulate, rather small, pointed; orifice quite entire; figmas two; stem firm, obtusely angular; leaves stiff, incurved at the edges; the lowest stem, rather shorter." A native of the banks of rivers in Lapland. 176. C. hirta, Schkuhr tab. 51. fig. 64. "Spikes nearly sessile, stout, male linear; bracteae foliacces, dilatant; glumes rounded, rather thick, nearly as long as the fruit; fruit egg-shaped, slightly on both sides, rather acute; orifice terminated; leaves very narrow, somewhat convolute." A native of alpine marshes in Lapland. 177. C. hispida, Wahlen. 137. Schkuhr tab. 8; fig. 64. "Spikes nearly sessile, cylindrical, very densely flowered; males several; bracteae partly embracing the stem, foliacces, long, rather remote; glumes as long as the fruit, mucronate; fruit inversely egg-shaped, lupid at the edges, with a somewhat two-toothed limb.; leaves broadish." A native of Barbary. C A R E Y, in Geography, an island situated in the Persian gulf. CAREY, Henry, in Biography, a poet and musician, who, perhaps, among philosophers, men of science, and artists of the first class, may be deemed somewhat too factious to be allowed a record here. But as he had the power of exciting mirth without profanity, indecorum, or licentiousness, which none of his buffoon predecessors, such as Cor- nyfel, Coriat, Tom Brown, Tom D'Urby, George Alexander Stevens, &c., could do; we think that, at least as long as many of his works are still in use, he should not be plunged into the gulf of oblivion. For though he was not a deep musician, or a great poet, he had genius and abilities in both these arts sufficient to interest and amuse the public by his productions, if not in a sublime manner, yet in a way not disgraceful to himself, or his admirers. This being premised as an apology for the hero of this article, and for his biographers, we shall proceed to detail the principal events of his professional life.

Of his birth and parentage we know nothing; and of his education are only certain that he was not a regular bred musician. It has been said, indeed, that he had his first lessons from a German of the name of Wicheloom Lennert; that Rufingavre had been kind to him; and that he was, in some sort, a disciple of Gemminian. But the result of all these instructions did not, as his friend Lamp, a man of truth, used to say, enable him to make a bafe to his own ballads.

Poor Carey has been under-rated by his biographers, in ranking him as a man of humour, a writer of ballads, and an inventor of melodies, below Tom D'Urby. Carey's humour may sometimes be low, but it was never gross or immoral; and D'Urby's was nothing else. For in the fix volumes of "Pills to purge Melancholy," there is scarcely an innocent song to be found.

The first we hear of Carey was, that he produced two farces in the year 1715, one of which, the Contrivances, is said in the Biographia Dramatica, to be a very entertaining piece, which had good success in its day.

In 1730, it appears, that when Miss Rafter, afterwards the celebrated Mrs. Clive, first appeared on the stage of Drury-Lane as a singer, it was at the benefit of Harry Carey, who seems to have been her singing-matter; the manner in which this benefit was announced in the Daily Puf, December 3d, is so singular that we shall transcribe the paragraph for the amusement of our readers. After naming the play, which was Greenwich Park, and the additional entertainments of singing; particularly a dialogue of Purcell by Mr. Carey and Miss Rafter, and a cantata of Mr. Carey's by Miss Rafter, there is an apology from Carey, for "the true
edly of half an act,” not being performed; but a promise is made of indemnification by the entertainments between the acts. The editor of the paper then adds; “but at our friend Harry Carey’s benefit to-night, the powers of music, poetry, and painting, assemled in his behalf, he being an admirer of the three fitter arts; the body of musicians meet in the Haymarket, whence they march in great order, preceded by a magnificent moving organ, in form of a pageant, accompanied by all the kinds of musical instruments ever in use from Tubal Cain to this day; a great multitude of bookfellers, authors, and printers, form themselves into a body at Temple-bar, whence they march with great decency to Covent-garden, preceded by a little army of priests and devils, with their proper instruments; here the two bodies of music and poetry are joined by the brothers of the pencil; when, after taking some refreshments at the Bedford Arms, they march in solemn procession to the theatre, amidst an innumerable crowd of spectators.”

Poetry and music, in high antiquity, formed but one profession, and many have been the lamentations of the learned that these fitter arts were ever separated. Honest Harry Carey and Jean Jacques Rousseau are the only bards in modern times who have had the address to reconcile and unite them. The Honefl Yorkfircman of Carey and the Devin du Village of Rousseau are indisputable proofs that popular brains, at least, if not learned and elegant music, may be produced by the writer of a dramatic poem. Carey, without musical learning, invented many very pleasing and natural melodies, which neither obscured the sense of the words, nor required much science to bear. But either from the ambition of the figner, or expectations of the audience, music is not suffered to remain simple long upon the stage; and the more plain and ancient the melodies, the more they are to be embellished by every new performer of them. The tunes in the Beggar’s Opera will never appear in their original simple garb again.

In 1732, he produced the words of two serious operas; Amelia and Taraminta. The firit of these was let by Lampe, and the second by the late Mr. Smith, Handel’s disciple, friend, and successor, in superintending the performance of oratorios.

In 1734, his mock tragedy of half an act, called Chrono- Ilagonologus, was first performed at the little theatre in the Haymarket; a piece of humour that will always be in fashion, as long as extravagance and bombast shall dare to tread the stage.

In 1736, and for several subsequent years, his little English opera, entitled The Honefl Yorkfircman, was almost always in conflagrant run. The year 1737 was rendered memorable at Covent garden theatre by the succefs of the burlesque opera of the Dragon of Wandefty, written by Carey, and fet by Lampe, “after the Italian manner.” This excellent piece of humour had run twenty-two nights, when it was stopped, with all other public amufements, by the death of Majefly Queen Caroline, November 30th, but was resumed again on the opening of the theatres in January following, and supported as many representations as the Beggar’s Opera had done, ten years before. And if Gay’s original intention in writing his musical drama was to ridicule the opera, the execution of his plan was not fo happy as that of Carey; in which the mock heroic, tuneful moniter, recitative, splendid habits, and style of music, all conpired to remind the audience of what they had been and heard at the lyric theatre, more effectually than the most vulgar street tunes could do; and much more innocently than the tricks and tranfactions of the molt abandoned thieves and profi!itors. Lampe’s music to this farceal drama, was not only excellent fifty years ago, but is still modern and in good taste.

In 1738 Margery, or the Dragoon; a sequel to the Dragon of Wandefty, written with equal humour, and as well fet by Lampe, came out; but had the fate of all sequels. When the novelty of a faulted is faded away, and the characters have been developed, it is difficult to revive the curiosity of the public about persons and things of which opinions are already formed. The Dragonfis appeared but few nights, and was never revived.

Name, or the parting Lovers, was produced after these, and likewise fet by Lampe; but the occasional songs and aulitas in which he wrote and fet to music himself, are innumerable. His burlesque birth-day ode, turned the odes of Cibber into ridicule as effectually as Pope’s Dunciad could do. And his ballad of Sally in our Alley, had the honour of being praised by Addison for the poetry, and Geminius for the tune. But though poor Carey was a successful poet and musician, he was always indigent and heavy on the hands of his friends. He seems to have been professionally active, he taught music at small boarding schools and private houses upon low terms, and had no particular vice or extravagance laid to his charge; but whether his embarrased circumstances, domestic unhappiness, the malignity of rival but less successful writers, or from whatever cause, in a fit of infancy or defpondency, Oct. 4, 1743, at his houfe in Warner Street, Cold bath fields, he terminated with a cord a life which he had innocefly, and not unfeafly, spent.

This precise date of his fatal catastrophe totally invalidates the claims that have been made of late by his fon for the honour of having written and fet the loyal and national song at the time of the rebellion in 1745, God save great George our King! which we have cogent reasons to believe was written for king James II, while the prince of Orange was hovering over the coast. And when he became king, who durst own or fign it? We are certain, that in 1745, when Dr. Arne harmonized it for Drury lane theatre, and C. B. for Covent-garden, the original author of the melody was wholly unknown.

Carey’s, chicken, or geese, Mother, in Ornithology. See Procellarta gigantea.

CARRA, in Geography, a town of Arabia; 175 miles N.W. of Janam.

CARRAFANO, or CASTEL-NUOVO DI CARFAGNANO, a town of the duchy of Modena, and capital of a lordship, which is partly in the Modenese, partly in the Bolognese, and partly in the republic of Lucca; 18 miles N. of Lucca, and 37 S.S.W. of Modena.

CARGADORS, a name given by the Dutch to a kind of brokers, who make it their fole business to find freight for ships which want lading, and vessels for merchants or passengers who want conveyance to fuch or fuch a place.

CARGO, the lading or freight of a ship. See Freight.

CARGO, portly, is that which contains something of every fort necessary to furnish the tmaders of the place it is fent to, with parcels fit to fill their foops, and invite their customes. Officers and tailors on board a veffel are allowed to carry a small cargo, or “paccoletti,” not exceeding a certain bulk or weight, for their own account, without paying any freight.

CARGO is sometimes alfo ufed for an invoice of the goods wherewith a ship is laden. See Invoice.

CARGO also denotes a weight ufed in Spain and Turkey, amounting to about 300 English pounds.

CARGO in Geography, a small island in the Persian gulf, near the coast of Farivatan.
CARHAIX, a town of France, in the department of Finisterre, and chief place of a canton in the district of Chauny, situated on the Yer, in a fruitful country, that feeds great numbers of cattle, with plenty of game; 64 leagues S. of Morlaix. The place contains 1734, and the canton 13,164 inhabitants; the territory comprehends 32,854 square kilometres and 9 communes.

CARHAM, a village of England, in the county of Northumberland, which defers notice on account of the singular events that have occurred in its vicinity. Near this place a battle was fought between the English and the Danes, in which 11 bishops and 2 English counts were slain, besides a great number of soldiers. Here likewise was fought, in 3518, a battle between the English and the Scots, in which the latter were victorious. In the 74th year of Edward I. an abbey was burned here by the Scots, under the command of Wallace; and in the 44th year of Edward III, 1370, Sir John Lilburn was defeated near this place by the Scots, under the command of Sir John Gordon, and taken prisoner with his brother. Carham is distant 5 miles E. of Kello, and 28 N.W. of Alnwick.

CARIA, in Ancient Geography, a province of Asia, occupying the south-western part of Asia Minor, or Anatolia. It is bounded on the north by Ionia, Lydia, and the river Meander, which separated it from Ionia; on the east by Great Phrygia and part of Lydia, its natural boundaries being high mountains; and on the south and west by the sea. Geographers, however, are not agreed about its precise limits. Their different opinions may be seen in Cellarius's Ancient Geography. This country was for some time called Phoenicia, because the Phœnicians had considerable establishments in it; but it is said to have taken the name of Caria from Car, the brother of Lydos; and it comprehended a small province, forming a kind of peninsula towards the south-west, called Doris, which see. The interior of this country presents some chains of mountains; the chief of which were Latmus, on the west towards Miletos, and the Montes Calendici, towards the south-east near Calinda. The principal towns of Caria were Miletos, Myndus, Halicarnassus, Cenamus, Bergafa, and Cnidus, which were situated along the western coast. The Rhodians possessed a part of this country towards the south, under the name of Perae, which see. In the interior of the country are found Alabanda, Apollonia, and Antiokia ad Meandrum, Aphrodias, Stratonece, Alinda, Pedasus, and, towards the south, Carinus, Calinda, &c. Caria was less cultivated than it might have been, because the inhabitants employed themselves very much in maritime concerns. Its mountains, however, furnished numerous flocks, and its wool was held in high estimation.

The Carians claimed the honour of being aborigines, (though some authors ascribe their origin to the Pelasgi, and others to the Cretans), and traced their name and origin to Car, the brother of Lydos and Myfus; and they thought this genealogy was confirmed by the antiquity of the temple of Jupiter the Carian, built at Mylasa, where, from time immemorial, they assembled in common with the Lydians and Myfians. Hence they concluded that they had the same ancestors with these people, according to the report of Herodotus. Homer, says Stephanus Byzantinus, represented the Carians as barbarians, because they were enemies to the Ionians; but the epithet ἄραξασικος, which this ancient poet applies to them, shews, that he referred to their language, and not to their political conduct. The Carians multiplied themselves to such a degree under the government of the descendants of Car, that they extended their establishments to the neighbouring islands. Accordingly they took possession of the isle of Rhodes, belonging to the Phœnicians, and thus the seer of this warlike nation to the other islands of the Aegean sea was completed. Thus relates Minos II. drove the Carians from the island of Erythrae; but Herodotus informs us, that Minos allowed them the possession of these islands, together with unconfined liberty to cultivate them, and an exemption from tribute, on condition of their furnishing his fleet with a number of vessels. In process of time different colonies of Carians were introduced into Caria, and the original inhabitants were obliged to retire into the mountains, and to fortify themselves against the attacks of their enemies. At length the fertile soil of their mountains retreated reduced them to a state of poverty, which ruined their courage; and they conformed vessels and traversed the sea, and thus acquired a degree of power, which gave them the rank of a maritime empire. Lauchus refers this period to the interval that elapsed from the 11th to the 27th olympiad. Diodorus Siculus fixes the epocha of the maritime power of the Carians immediately after the taking of Troy, and pretends, that by means of their vessels they got possession of the isle of Lycus. Herodotus says, that they very much contributed to the perfection of the military art by their ingenious inventions. The Carians, who were both a maritime and military people, affixed in establishing Pharnacesius on the throne of Egypt, and he recompensed their services in a very liberal manner. Thus attached to the interest of his house, they succoured Apricus, the last of the descendants of this prince, when Egypt attempted to emancipate themselves from his power, and for some time resisted the attacks of all his enemies; but when Apricus fell, they were obliged to submit to the conqueror. Amanis, conscious that they would afford him very considerable support, engaged them in his cause, by assigning to them a territory in the district of Memphis, the capital of his dominions. They evinced their attachment to Pharnacesius, the son and successor of Amanis, when Cambyses undertook the conquest of Egypt. Accordingly they joined his army; but when the Persians proved victorious, the surviving Carians retired into their own country, which had suffered much from its contests with the kings of Lydia. Alyattes was the first of all the successors of Gyges who formed the project of reducing the Carians to his dominion; but he probably did not succeed, as Herodotus reckons Caria in the number of the provinces annexed to the empire of Lydia by the arms of Cyrus. After various struggles in defence of their country and their liberty, they were at last obliged to submit to the Persians, upon the reduction of Miletus. In the expedition of Xerxes against Greece, the Carians assisted him with 70 vessels, which were annexed to his naval armament. Lydamis, to whom, according to Pausanias, the Lacedemonians erected a statue, ascended the throne of Caria towards the 85th olympiad, and was succeeded by Hectoramus, who made Myfusa the capital of his kingdom. He was allowed by the Persian court to possess the kingdom of Caria till his death, which happened in the 99th or 100th olympiad. His successors reigned 42 years. Artemisia, the second of that name, married Mavolus her brother, according to Arrian, who pretends that custom authorized such marriages in Caria. This prince reunited the whole of Caria under his dominion, and fixed his residence at Halicarnassus, which surpassed in magnificence all the cities of Caria. Mavolus made successful attacks on the Ionians, Lydians, and Lycians; and under his conduct the Carians got possession of the island of Rhodes. At the death of Mavolus, in the 4th year of the 106th olympiad, B.C. 353, the Rhodians threw off the yoke of the Carians; but Artemisia, the sister and widow of this prince, reduced them to their allegiance, and
and also the inhabitants of the island of Cos, who had imitated their neighbours in their revolt. At the death of Artemisia, Idrieus assumed the reins of government, and when he died, the Carians conferred the crown on Ada, his sister and wife. Diodorus Siculus says, that the Persian king gave the inviolability of the kingdom to a fatrap; but Ada courageously refuted him, and at length, deprived of her dominions, the retired to the fortress of Alinda, which she maintained till the arrival of Alexander in Asia. When Alexander had gained the battle of the Granicus, he penetrated into Caria, and re-established Ada in possession of her kingdom. Arrian says that Ada adopted Alexander; but Plutarch conjectures, that this conqueror adopted Ada, and always called her his mother.

Cariana, a town of Asia Minor, in a country of the same name. Ptolemy places it in Lycia. Caria was also an episcopal town of Asia, placed upon the Maeander.

Caria, a name given by Arrian to a maritime country of Scythia, on the Euxine sea. It was an establishment of Carians, on this side of the Dorylithenes, and at a distance from the Tanais.

Caria, in Entomology, the name by which several travelers distinguished those Mishicous insects that infest the East Indies, Africa, and other parts of the world, and which are known among modern naturalists by the name of Termites, and white ants. See Termes.

CARIABAD, in Geography, a town of Hindooftan, in the foubah of Oude; 40 miles N. of Lucknow.

CARIACO, a large gulf in the province of Comana, Terra Firma, South America. On the northern side at its mouth is Fort St. Yago, in N. lat. 10° 7', W. long. 63° 30'; and on the southern side cape Bordones.

CARIACOU, the chief of the small islands dependent on the island of Grenada, in the West Indies; situated about 4 leagues from the Rosene, which is equally distant from the north end of Grenada. N. lat. 12° 30'. W. long. 61° 22'. It contains 6013 acres of land, and in general is fertile and well cultivated, producing in feasonable years a million of pounds of cotton for exportation, besides corn, yams, potatoes, and plantains sufficient for the maintenance of its negroes. The cultivation of sugar has been found less successful in this island than cotton, though it still continues to be made on two plantations. The number of inhabitants in 1779 was 5000; but they have since decreased. See Grenada. Caracci forms a 7th parish belonging to Grenada; and by an act passed in 1784, a bishop is provided for a clergyman in this parish. The parish town of this island is Hillborough.

Cariacou, in Zoology, a species of Cervus, which see. CARIAMA, in Ornithology, the name of a Brazilian bird, described by Marcgrave in his History of Brazil; this is the crested feremacc, Patandra cribrata of modern naturalists.

Carianers, Carayners, in Geography, a people of singular description that inhabit different parts of the Birmian empire, particularly the western provinces of Dalla and Baffien; several societies of whom also dwell in the district adjacent to Rangoon. None of them are to be found higher up than the city of Prome. They are a simple innocent race, speaking a language distinct from that of the Birmans, and entertaining rude notions of religion. They lead altogether a pastoral life, and are the most industrious subjects of the flat: their villages form a fetch community, from which they exclude all other sects, and never reside in a city, nor intermingle, nor marry with strangers. They profess, and strictly observe, universal peace, not engaging in war, nor taking part in contests for dominion; and thus they are placed in a state of subjection to the ruling powers. Agriculture, the care of cattle, and the rearing of poultry, are almost their only occupations. A great part of the provisions consumed in the country is raised by the Carians, who particularly excel in gardening. The oppression which they have lately suffered has induced numbers of them to withdraw into the mountains of Arracan. They have traditional maxims of jurisprudence for their internal government, but they are without any written laws; custom, with them, constitutes the law. Some of them learn to speak the Birmian tongue, and a few can read and write imperfectly. They are timid, honest, mild, in their manners, and very hospitable to strangers. Symes's Embassy to Ava, vol. ii. p. 100.

CARIATA, in Ancient Geography, a town of Asia, in Castriana, destroyed by Alexander.

CARIATI, Nuisa, in Geography, a town of Naples, in the province of Castralia Citra, situated on the S.W. coast of the gulf of Tarento; 25 miles N. of St. Severino, N. lat. 39° 58'. E. long. 16° 6'. At the distance of 2 miles S.W. of the former is Cariati Vecchio, in the same province, the seat of a bishop, suffragan of St. Severino. It is farther from the sea, towards the river Caneta. Cariati is a principality belonging to the family of Spinelli, one of the most opulent feudal families, divided into several branches, and possessed of very capital hills in Castralia. The founder of this family was John Battist Spinelli, who was very much distinguished by Ferdinand the Catholic, on his arrival at Naples, and enabled to purchase Cariati and other considerable estates, since augmented by the prudence of his descendants. The city is small, and thinly inhabited, on account of the weakness of its situation, and dread of the Turks, who, before a treaty was concluded with the Porte, were continually ravaging this coast. Its cathedral is a very heavy Gothic structure, dedicated to St. Peter, and the only parish. The surrounding hills are gay, and pleasingly covered with fruit-trees; the woods behind them produce manna of excellent quality; much Turkey wheat is cultivated in the lands below, and extensive patters afford luxuriant and wholesome fulness to a great flock of oxen, buffaloes, sheep, goats, and llamas.

CARIATIDES, or Cariates, in Architecture. See Caryatides.

CARIBALDI. See Caribaldi.

CARIBBEAN sea, in Geography, that part of the Atlantic ocean, which is bounded on the north by the islands of Jamaica, St. Domingo, Porto Rico, and the Virgin islands, on the east by the Caribbean islands, on the south by the country of Terra Firme, and on the west by the Musketto shore.

CARIBBEE islands, a range of islands extending in a kind of semicircular form, from Tobago in the south, to Porto Rico in the north, and enclosing as it were between them and the main land the Caribbean Sea. They were discovered by Columbus in his second voyage, in November, 1493; and thus called by him from the name which the natives of Hispaniola gave to their ancient poecellers. The term Caribbee or Charliean is rigidly applicable only to the windward islands, which were inhabited by the Caribbees or Charrabaes; and the four large islands of Cuba, Jamaica, Hispaniola, and Porto Rico, are denominated leeward islands. But English mariners appropriate both terms to the Caribbean islands only, subdividing them according to their situation in the course of the trade wind; the windward islands terminating by their arrangement with Martino, and the leeward commencing at Dominica, and extending to Porto Rico. The Caribbean islands are eminent-
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int ier, and in a commercial view highly advantageous; their chief poiffons are the English and French. Barbadoes, Antigua, St. Christopher's, St. Vincent, Dominica, Grenada, Montserrat, Nevis, and the Virgin isles are British; and the French poiffons Martinique, Guadalupe, St. Lucia, Tobago, and some isles. To the Danes belong St. Croix, St. Thomas, and St. John, parts of the Virgin group; the Swedes hold St. Bartholomew; and the Dutch St. Eustatius. Of the whole group lying between the 55th and 60th degrees of W. longitude, and the 15th and 16th degrees of N. latitude, Barbadoes and Guadalupe are the most important; and the latter, including Grand Terre, and Baffle Terre, is the most considerable in size. For a farther account of each isle, see its appropriate article.

CARIBBEES, or CHARAIBES, the ancient poiffons of most of the isles above mentioned. Columbus in his first voyage received information, that several of these isles were inhabited by a people of this name, who were fierce, bavage, and predatory, the terror of the mild and inoffensive inhabitants of Hispaniola, and who delighted in the horrid banquet of human blood. In his second expedition, he found this information to be just, and was himself a witness of their trepid value. In their habitations, when he landed at Guadalupe, he found relics of those feasts which they had made upon the bodies of their enemies taken in war; and at the same time, he released several of the natives of Porto Rico, who, having been brought captives from thence, were released as victims for the fame horrid purpose. See CARRIBAL. The fame character for value and intrepidity has been invariably maintained by these people in all subsequent contests with the inhabitants of our continent; and even, in our own times, they have made a gallant stand in defence of the large territory which the rapacity of the Europeans had left in their poiffon. M. de Chanaval, an intelligent and philosophical observer, who visited Martinique in 1751, and resided there six years, gives the following description of the Caribbees. "It is not the red colour of their complexion, it is not the singularity of their features, which constitutes the chief difference between them and us. It is their execrable simplicity; it is the limited degree of their faculties. Their reason is not more enlightened or more provident than the instinct of brutes. The reason of the most gross peasants, that of the negroes brought up in the parts of Africa most remote from intercourse with Europeans, is such that we discover appearances of intelligence, which, though imperfect, is capable of increase. But of this the underdaunting of Caribs seems to be hardly susceptible. If found philosophy and religion did not afford us their light; if we were to decide according to the first impression which the view of that people makes upon the mind; we should be disposed to believe that they do not belong to the same species with us. THEIR RUPID eyes are the true mirror of their souls; it appears to be without functions. Their indolence is extreme; they have never the least politeness about the moment which is to succeed that which is present." Voyage à la Martinique, p. 44, 45, 51. M. de la Borde, Terre, and Rochefort, confirm this description. Mr. Edwards (ubi infra) very properly observes, that M. Chanvalon seems to have formed his judgment of all the Charaibes from the few with whom he had any communication, and that he makes no allowance for their degradation in a state of captivity and servitude; though he admits this circumstance and wrongly urges it in favour of the African blacks in the West Indies. The Caribbees evidently appear by the marked distinction of their character to be a separate race from the inhabitants of the larger islands. Their language is totally different; and among themselves, they have a tradition, that their ancestors came originally from some part of the continent, and having conquered and exterminated the ancient inhabitants, took possession of their land, and of their women. Hence they call themselves "Babares," which signifies a man come from beyond sea. Accordingly, the Caribbees hold two distinct languages, one peculiar to the men, and the other to the women; nor has the language of the men any thing common with that spoken in the larger islands; whereas the dialect of the women confiderably resembles it. The tradition derives from this circumstance considerable confirmation. The Caribbees themselves imagine, that they were a colony from the "Gallis," a powerful nation of Guiana, in South America. But as their fierce manners approach nearer to those of the people in the northern continent, than to those of the natives of South America; and as their language has some affinity to that spoken in Florida, their origin should be deduced rather from the former than the latter. In their wars, they still observe their ancient practice of destroying all the males, and preferring the women either for servitude or for breeding. Rochefort in his account of the Antilles, published in 1698, conjectures, that they sprang originally from Florida, and describes them as a colony of Appalachian Indians, who, being driven from the continent, arrived at the windward islands, and exterminating the ancient male inhabitants, took possession of their lands, and of their women. But being unable to subdue the inhabitants of the larger islands, these retained their distinctive manners and character. Mr. Edwards agrees in opinion with thofe, who trace their origin to a South American colony. To this purpose he says, that there anciently existed many numerous and powerful tribes of Charaibes on the southern peninsula, extending from the river Oronoko to Effegubes, and throughout the whole province of Surinam, even to Brazil, some of which still maintain their independence. With one of these tribes Sir Walter Raleigh formed an alliance, in his romantic expedition to Guiana in 1595; and he affures us, that the Charaibes of that part of the continent spoke the language of Dominica. Mr. Edwards, indeed, inclines to the opinion of Hornius, who assigns to these people an oriental ancestry, that migrated to the west across the Atlantic; and in confirmation of this opinion he alleges a similitude in the language of the Charaibes to the ancient oriental dialects, and also a striking resemblance in their customs and manners to those of the inhabitants of the east. The word "Charaibe," he says, in the Arabic language, signifies a robber or despoiler, an appellation frequently bestowed by the natives on the invaders of their country. As there were priests or prophets in Brazil under the appellation of Charaibes, they might have been called בֶּרֶב, as men who offer בֶּרֶב, corban, an offering (see Lev. i. 2); and καρπίας is the Greek for a priet of Cybele, or one of the Corybantes. But if the national name be derived from the warlike and predatory life of the Charaibes, we may derive it from בֶּרֶב, signifying in Syr. and Arab. to lay waste. The noun denotes a sword or spear, and בֶּרֶב Sam. war.

Mr. Edwards has given us an highly interesting description of these savages; their national manners, habits, education, and such political and religious institutions as savages could fabricate; of all which we shall present our readers with the following concise epitome, referring to the author himself (ubi infra) for a more ample detail. Every trait in the character of a Charaibe marks him for a foreigner. The antipathy which this fierce race bears to the unoffending and more cultivated nations of the larger islands of Hispanic,
paniola, Cuba, and Jamaica; his robust and muscular form, his towering, independent spirit, disdainful of restraint, and impatient of calamity; his dreadful feat on the human flesh of captives, whilst towards his own brethren he is faithful, kind, affectionate, and peaceable; and the incitement which he makes on his fearrified, panting alternately with black and crimson, to render him terrible to his enemies in battle:—all conspire to proclaim him an exotic, transplanted either by design or accident from some distant clime, and bearing with him to his new abode the internecine impositions of his primitive age. A Charaibe youth is educated amidst accumulated toils and sufferings. One of the earliest maxims inculcated on his tender mind was to bear exquisite pain without murmuring:—like the Spartan youth at the altar of Diana, he was scourged until agonizing nature was nearly exhausted; but no light was heard, no tear was seen to fall; for, if the severities which he suffered occasioned the least sign of weakness or sensibility, he was disgraced for ever. Public honours and national rewards crowned the fortitude that never shrunk from inflicted torture:—above all things, he was taught to cherish an inexorable hatred, and an intractable thirst of revenge, against his natural enemy, the Arrowawks (which see), the inhabitants of Hisp aniola, Cuba, and Jamaica. When more mature years called the Charaibe to the field, stripes, burning, and flogging, constituted the trial of him who was to lead the national troops to action. His heart thus hardened, and his nerves thus fledged, he beheld the unbounded carnage of his foes without the least remorse, nor checked his savage squadrons in the career of their fanatical vengeance. Of their political maxims, one very prominent but disgusting feature is displayed in that abortive villainy in which the Caribbes keep their women. They are mere household drudges through life, and are denied even the privilege of eating in the presence of the tyrant husband. Mr. Edwards, on this subject, very justly oberves, that the first visible proof that a people are emerging from savage manners is a display of tenderness towards the female sex. As the successful warrior was allowed to appropriate to himself as many of the captives as he thought fit, and his countrymen presented to his choice the most beautiful of their daughters in recompense of his valor; this last mentioned testimony of public esteem and gratitude probably gave rise to the institution of polygamy, which prevailed universally among the Charabes, and still prevails among those of South America. This institution, says Mr. E., is the more excusable, as their women, from religious motives, carefully avoided the nuptial intercourse after pregnancy. Their females, on attaining the age of puberty, were distinguished by a sort of bulky, or half boot, made of cotton, which surrounded the snall of each leg. In other respects both males and females appeared naked. Their hair, which was of a shining black colour, was dressed and adorned with peculiar attention; and the men, in particular, decorated their heads with feathers of various colours. On the death of a relation or friend, they cut it short like their flaves or captives, to whom the privilege of wearing long hair was rigorously denied. Like most other nations of the New Hemisphere, they nicely eradicated the incipient beard, and all foppish hairs on their bodies. On the birth of a child, its head was confined between two small pieces of wood, placed one before and the other behind, which, being firmly bound together, elevated the forehead, and occasioned this and the back part of the skull to resemble two sides of a square. They resided in villages, which resembled an European encampment; and their cabins were built of poles fixed circularly in the ground, drawn to a point at the top, and covered with leaves of the palm tree. In the centre of the village was a building, larger than the rest, which served as a kind of hall, or state house, where their youth were educated to emulation, and trained to martial enterprise by the renown of their warriors, and the harangues of their orators.

Few arts and manufactures can be supposed to flourish among savages: yet the Caribbes ingenuously manufacture a subtilisn kind of cotton cloth, which they spin with various colours, and of which they make kamosos, or hanging-beds; they also fabricate ornamental veils of baked clay; they work very elegant balusters of the fibres of the palmetto-leaf; and their bows and arrows are slighlty with circular flint and neatness. Among the Caribbes of the continent, there was no division of land, every one culti-

vating in proportion to his exigencies. Their food, both vegetable and animal, except in the circumstance of their eating human flesh, seems to have been much the same with that of the natives of the larger islands. However, they held the flesh of some animals in abhorrence; such as that of the peccari, or Mexican hog, the marmot or fox-sow, and the turtle. They frequented also to eat the ed, abundantly sup-
plied by several of their rivers. In some of these respects they manifested a conformity to the customs of the Jews. It is a singular circumstance, that on the birth of the first for the father retired to his bed, and failed with a fraticellus that often endangered life. A similar practice has been recorded concerning the Tybarenians of Africa, and the Iberians of Spain, and is still obsered by the people of Japan. This ceremony of fathering was succeeded by rejoicing, drunken-
ness, and debauchery. They indulged extraordinary grief for their dead; they not only deplored their hair, but when the master of the family died, the surviving relations, after burying the corpse in the centre of his own dwelling, with many demonstrations of unaffected grief, quitted the house altogether, and erected another in a distant situation. It was their custom to place the dead in the grave in a sitting posture, with the knees elevated to the chin. As to their religious opinions and practices, we may observe, that they entertained the expectation of a future state, and pleaded themselves with the fond conceit that their departed relatives were secret speculators of their conduct, sympathizing in their sufferings, and participating in their welfare. But regarding the soul as incapable of the fame impressions and obnoxious to the fame passions, as when allied to the body, they deemed it a religious duty to their deceased heroes, to sacrifice at their funeral. Some of their captives which had been taken in battle. Immortality, without military glory, was considered by them as a curse; to the brave and virtuous, as to their wives and captives, they allotted a kind of Mahometan paradise; but to the degenerate and cowardly they sighed a fate of punishment somewhere beyond the mountains, and an ignominy aggravated by captivity and servitude among the Arrowawks. The life of the Charaibe is not passed without acts of devotion paid to the universal Father. In every cottage is erected a rustic altar, compo-

sided of banana leaves and reeds, on which they offer to the Deity the earliest of their fruits, and the choixeit of their provisions. His religion, in fact, however, is a religion of horror; in part, perhaps, the result of the tremendous irregularities of the climate. They mark an avenging deity, amid the madnes of the hurricane, and amid the convulsions occasioned by frequent earthquakes. In the loud thunder of the tropic, the voice of the incensed deity is heard, while his arm in imagined vengeance launches the lightning which fires the flailng fields of corn, and ampi-

hilitates the proming barrel. Accordingly, besides the
writings which they paid to beneficent deities, they not only believed in the existence of demons and evil spirits, but offered to them also by the hands of their "Boyex," or pretended magicians, sacrifices and worship; wounding themselves, on such solemnities, with an instrument made of the teeth of the augurs, which inflicted horrible gashes; conceiving, perhaps, that the malignant powers delighted in groans and misery, and were to be appeased only by human blood. (Robertson's America, vol. ii. Edwards's Hill of the Well Indians, vol. i.)

CARIBBEAN. See Paria and New Andalusia.

CARIBOU, an island towards the call end of Lake Superior, in North America, S.W. of Montreal bay. N. lat. 47°, W. long. 83° 30'.

CARIBOU, in Zoology, an American animal of the flag kind. See Cervus carbon.


Gen. Ch. Male. Col. very small, with five teeth. Cor. monopetalous, funnel-shaped; tube slender, long, gradually flattened downwards; border five-cleft; segments lanceolate-linear, obtuse, obliquely and spirally revolute. Stamina ten, at the top of the tube of the corolla; five alternate one shorter; anthers oblong. Female. Cal. persistent small, five-toothed, permanent. Cor. pentapetalous. Linn. Gart. five-cleft, Jiff. Vent. Linn. petals or segments lanceolate-linear, very long, erect below the middle, reflected and twisted above. Pyg. germ superior, egg-shaped; styles short; stigmas five, oblong, expanding; widened, truncate, and crenulate at the summit. Fr. ric. berry large, five-furred, one-celled, fleshy. Seeds numerous, attached to five receptacles in the middle of the berry, obovate, egg-shaped, pointed, encloled in a brittle, wrinkled tunic or aril.


Species. 1. C. papaya. Linn. Sp. Pl. (C. vulgaris, B. Lancy. Meth. Papaya caraica, Gart. tab. 137. fig. 2. Linn. Milt. Pl. 81. Papaya-marmal, Rheem. Mal. tab. 15. fig. 1. Ambapaya, tab. 15. fig. 3. Abbrev. of Carib.) Common papaya tree. "Loches of the leaves flattened." Somewhat the habit of a palm. Rost perependicular, whitish, spongy, of a disagreeable taste and smell. Stem twenty feet high; a foot thick; naked almost to the top, marked almost its whole length with the scars of fallen leaves, of a tender sub-tance like that of the banana, solid towards the base, hollow in its upper part. Leaves on petioles near two feet long, the lower ones almost horizontal, upper ones erect, deeply divided into seven, nine, or eleven, sinuate and garded lobes, alternate, near together. Flowers axillary, white, sweet-scented; male in slender, pendulous racemes, two or three feet long; pedicell short; females numerous, on short simple peduncles. Fruit about the size of a small melon; various in its form, sometimes angular, and flattened at both ends, sometimes oval or round, and sometimes pyramidal, yellow when ripe; containing a yellow succulent pulp of a sweetish taste and aromatic smell. It is seldom eaten raw, but, when boiled, is esteemed a wholesome sauce to any kind of flesh meat. It is also sometimes pickled in vinegar, and is frequently preferred in sugar, and sent to Europe with other tropical sweetmeats. When ripened in our stores, it does not acquire its proper flavour, and is even bad by Miller to be detectable. The whole plant abounds with a saucy sound Jude. Male flowers are occasionally found on the female plants, and female on the male ones. A native of both the East and West Indies. 2. C. papaia. Linn. Sp. Pl. Efl. Pte. tab. 39. fig. 1. "Loches of the leaves entire." Stems more frequently branched than that of the preceding. Leaves less divided, and often entire. A native of Sumatra and Peru. 3. C. fiesieta, Gmel. Syn. Nat. F. B. Lancy. Method. Abb. Guian. ii. p. 918. tab. 346. "Leaves simple, leaflets quite entire; stem with laminated leaves." Fruits branched at base to less than a third of its height. Leaves fivelug, smooth, pointed, green above, whitish underneath. Berry yellow, egg-shaped, smooth, marked with several longitudi- nal furrows; fleshy yellow, succulent. A native of Guiana and Brazil.

The shrill species only has been cultivated in Europe. It is easily propagated by seeds brought from its native climate, which should be sown in a hot bed early in the spring. When the plants are near two inches high, they should be transplanted separately into small pots filled with a light, gentle, loamy soil, and plunged into a hot-bed of tamer's bark. As they advance in growth they will require larger pots and when they are too tall to remain under frames, they must be placed in the tan-bed of the frove, where they will grow to the height of near twenty feet in three years, and produce flowers and fruit. In every period of their growth they should be sparingly watered. Mart. Mil.

N. B. The amona triboba, trifid frutet cufland-apple, is also called the papaw-tree in the southern states of North America.

CARICA, among Ancient Naturalists, denotes a kind of fig peculiar to Syria; sometimes also the dried fig. It is also used in ancient writers to denote the fruit of the palm tree, otherwise called cariotes, which was fent annually to clients on New Year's day, as a present or acknowledged by their patrons.

CARICA, in Zoology, a species of Mures, which fect.

CARICATO, had loaded: a term in Mijus, usually applied to the base finger in an Italian biricella. as Baffo caricato; to a long of which the accompaniments are too full; or to any thing crowded or overcharged. See Charge.

CARICATURA, in Painting, a loading, or exaggeration of the defects of an object represented, with a concealment of the beauties or advantages of it; yet so as to preserve a resemblance.

The word is Italian, formed of carica, a load, burden, or the like.

CARICOUS Tumour, in Surgery, is a fig-like excresence, (usually named ficus by the moderns) situated near the anus or pudendum, and frequently arising from illicit amours. See Ficus.

The etymology of the term carious has been sometimes mistaken. It is derived from carica, a dried fig, and does not mean the same as karpodes; although the editors of a new medical and phisical dictionary, copying the error of Quincy, say that "the carious tumour is called by Hip pocrates karpodes:" whereas, another term word (according to Galen, Suidas, Erodian, Hefychius, Philocrates, and others), denotes a kind of luxurious reu, composed of blood and various condiments, invented by the Lydians, and which Varinus supposes the obtained the name of karpodes, because it was of a blackish colour, resembling boiled walnuts. Vide Gorriei Def. Medic. Lexic. Schelchu, and Econ. Hippocr. Pafli.

CARICUM, a cathartic application for cleaning for-
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del, ulcers, and eroding fungous flush. See Hippocrates de Ulecibus; and *spona*, in Galen's Exegesis. It is prepared of black hellebore, sandarach, *fusana eris*, washed lead, sulphur, opomint, and cantharides; these being mixed, are made up with oil of cedar into a liquid medicine. Sometimes there is added arum, in decoction or juice, or the powder of it mixed with honey. The dry medicine or powder, for the same purpose, is prepared of the same ingredients, omitting the oil of cedar, and the honey; it is also made of black hellebore and sandarach only.

CARICUS, in Ancient Geography, a river of the Peloponnesus, in Laconia.

CAR RIDES, or CARIDA, a town of Asia Minor in Phrygia. Beth. Byz.

CARIDEN, in Geography, an island of Asia, in the Indian sea, near the west coast of the island of Ceylon: 12 miles long and two wide. N. lat. 8° 30'. E. long. 75° 57'.

CARLBOEFE mountains, a ridge of mountains in the western part of North America. N. lat. 58° 45'. W. long. 115°.

Caries, in Surgery, is a term which implies a corruption or putridity of some part of the animal body: this word was used by the older surgeons, and especially by those of the middle age, to denote a foul or corroding ulcer of the genitals, arising from impure coition; but we now almost exclusively apply it to a diffilution of the bony structure, either in an actually dead state, or tending to death. The most general definition of caries, is into the dry and the moist.

The former species may best be compared with a dry gangrene of the soft parts. The bone is white, dry, and dead, but otherwise smooth and even; no appearance of putrefaction, matter, or exulceration is visible; only it is observed, that the bone is incapable of adhering to the surrounding soft parts, or when separated from them, of again forming an adhesion with them. In the majority of cases, this caries begins at the surface; much more rarely in the internal substance, of the bone. Sometimes it changes into the humid caries.

The humid caries is, with respect to a bone, the same as an ulcer with regard to the soft parts. In this disease the bone is yellow, brown, or black, corroded, uneven, partly conformed, and a fetid matter issues from it. It is distinguishable into the occult, and the open caries.

In the first, the bone is still covered with soft parts, and the external integuments are either entire, or there exists already an ulceration, which nevertheless does not lay the bone bare. In the first case the integuments over the diseased part of the bone are walled, relaxed, oedematous, red or livid; without, however, being inflamed. The patient constantly feels gnawing, lancinating pains in the bone below the part, which are increased by external pressure; and when the disease of the bone is of any considerable extent, the patient is generally affected also with a low hectic fever.

In the second case, the ulcer in the soft parts is generally very obliterative and of a foul appearance, without any manifest cause; it discharges a great quantity of very ill-conditioned matter, and it is relaxed and surrounded with fungous excrecences. All endeavours to heal it prove ineffectual, or if it does in time, it soon breaks out again; and frequently, when the cause of this obliterative is not discovered, these ulcers are conceived to be of a malignant and cancerous kind.

The open humid caries may be known by the more or less copious discharge, which has an intolerable and peculiar fætus, leaning with black spots, and discolouring the silver probes that are introduced into it, and in which generally small black particles are seen to float. The ulcer in the soft parts is relaxed, uninflamed, spongy, and much inclined to bleed, and the bone is entirely bare, soft, uneven, corroded, brown or blackish. Sometimes a great quantity of fungous flux grows out of the bone itself, which easily bleeds, covers the bone, and thus renders both the diagnosis and the cure of the disease more difficult. This species of caries may be compared with fungous ulcers of the soft parts. In another species of caries, the bone seems to be gradually converted into mucous sub stance.

The humid caries begins either in the inner part of the bone or at its surface. In the former case, the patient first experiences for a long time violent pains in the bone, which are not increased by external pressure; after which the bone becomes swelled, the disease makes its way through the bone, attacks the soft parts, and terminates in an open caries. This species of caries, which begins in the interior substance of the bone is far more dangerous than that which commences on its external surface; in other respects there is no material difference between the two species; for the internal caries is frequently produced by external causes, and the external caries may sometimes proceed from internal caries. Caries is sometimes combined with an enlargement of the bone, and that most frequently when the caries begins in the centre of the bone; however, it occurs also not infrequently in the caries which begins externally. This swelling, nevertheless, does not alter the character and manner of treating the caries; it may occur as well in a mild as in a malignant caries, and sometimes after the original disease has been cured, the swelling may remain during the life of the patient.

Besides these, several other subdivisions of the caries may be enumerated; such as,

1. The gangrenous caries, which is a variety of the dry caries. The colour of the bone is not much changed at first, but when the exfoliation begins, it becomes greyish, afterwards brown, and finally black. The exfoliation takes place more easily than in the other species of caries, after the manner of a perceptible exfoliation. The same also happens here which is observed in the separation of gangrenous sub stance in the soft parts. (See the Art. Gangrene.)

2. Another variety of the humid caries is the worm-eaten (caries of Petit, which may be compared with an ulcer of the soft parts, having many cavities, and when the discharge proceeds from corrupted marrow; or with an abscess, the matter of which oozes out through a number of small orifices in the skin. The bone becomes spongy, and full of holes, but it is not very black. The discharge is copious, and generally it blackens silver probes. Portions of the bone separate themselves; however, no regular exfoliation takes place, unless this species of caries is changed by art into the above-mentioned gangrenous caries. The bone is gradually decayed and consumed by the suppuration, and it becomes so brittle that it can hardly be touched without breaking.

3. The fungous caries is in all respects similar to the preceding, except that spongy flesh, which readily bleeds, grows out of the carious bone.

4. The phagedenic caries. In this disease, the periosteum is thickened, the bone becomes soft, and from its carious surface a fungous substance, of a red or yellow colour, forms forth. When the disease spreads deeper, it gradually destroys all the osseous fibres. This species is distinguished from the fungous caries mentioned above by the circumstance, that in the latter the spongy flux proceeds from the holes of the bone, the edges of which, though discoloured, still remain hard and offensive; whereas, in the phagedenic caries,
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The affection first appears wherever the fungous flesh surmounts the bone, and on the surface of the bone. We may therefore be disposed to determine whether the bone were carious or not. For when we rub it under the fingers, it is not smooth, and the end of the bone, its surface, though uneven, does not seem to be very rough, neither can any considerable discoloration be perceived in it.

5. The fungous caries is discovered on opening a fungous abscess, when frequently the bone beneath, though of the natural colour and smooth, is found to be detached from all connection with the soft parts. Being now exposed to the air, it gradually becomes discoloured, and, with some degree of roughness, as far as it no longer adheres to the subjacent parts, sufficiently evinces that the circulation in it is interrupted. Another species of fungous caries is that which occurs in white swellings of the joints. (See Wrinfe Swelling.)

6. The cancerous caries commences with an enlargement of the bone; which in some parts is soft, and its internal substance neither fibrous nor cellular, but seemingly composed of an irregular accumulation of carious matter. It is covered with a tenacious or cartilaginous fibrous tissue, from which a smooth fungous exudation grows out, and exudes a limpid acid and fetid ichor. The patient complains much of deep-seated, pulsating, and very acute pain; and the ulcer bleeds profusely in consequence of the gradual corrosion of the walls at its surface. This species of caries may be compared with a cancer of the soft parts, to which it also is frequently superinduced, when the cancer has spread itself as deep as the bone. (See Cancer.)

As a species of caries, may also be mentioned that gradual wearing away and consumption of the bone, which takes place when they are exposed to constant pressure, as for example, in aneurisms, hydroceles internus, &c.

The Necrosis is, indeed, generally considered as a disease of the bones distinct from caries; however, it may not improperly be looked upon as a species of the dry caries, with a total privation of the living principle.

In all cases in which an ulceration of a bone discharges a large quantity of matter, the surgeon must not rest till he has discovered and sufficiently opened the source from whence the discharge proceeds. The humid caries spreads itself constantly farther and farther; and that more rapidly, and in a more violent degree, the looser the bone is, and the more the discharge of matter is obstructed by any cause. Moreover, the consequences of the humid caries are as various, and of the like nature, as those of ulcers; for not only the functions of the disintegrated part, but also those of the neighbouring organs, are always more or less affected; the patient is weakened by the daily loss of fluid; his blood is vitiated by the absorption of the matter, and a hectic fever is produced, with a constant state of tertian fever.

The most frequent causes of the dry caries are external injuries, whereby a bone is laid bare; and in consequence of a deficiency of nutritive fluid, the ascents of the external air, or the contact of vitiated liquids, destroys the living principle and dries up. In such cases it retains its vital powers longer in young subjects than in old. Sometimes this species of caries takes place spontaneously; probably when any pannicula acuminatus, especially of the atheal or venereal kind, is deposited upon the periosteum.

The humid caries is produced by causes similar to those of ulcers in muscular parts; and may even be produced by such ulcers, when they penetrate as far as the bone. This caries may therefore be divided into as many species, as there are species of ulcers, with respect to their causes; and of local causes the most frequent are the ulceration, erosion, and violent condition of the bone.

The danger in caries depends, as in ulcers, upon the absorption of unhealthy matter, the dry bones of fungi, and the consequent hectic fever; but in caries, the absorption of matter takes place to a much greater degree, and, to the sick, is more pernicious, as the disease is deeper seated, and the matter extremely acrid and corrupted. The propensi, depends upon the situation or condition of the bones, the extent of the caries, its cause, and its duration. (See Ulcer.)

The dry caries requires for its cure that the dead substance be separated from the living; and this is done either by a perceptible or imperceptible exfoliation, which is effected either by a chymurgical operation or the efforts of nature. When the surgeon foresees that an exfoliation is about to take place, he must open the ulcer in the flesh sufficiently, and keep it open, in order that he may be able to extract the separated portions of bone. But in an imperceptible exfoliation this is not necessary. A perceptible exfoliation generally takes place when the dead portion of bone is strong and thick; but a thin layer of dead bone commonly exfoliates imperceptibly, as do loose and fungous bones; hard and firm bones commonly exfoliate perceptibly. In young subjects the bone is more readily comminuted, and the imperceptible exfoliation is much more frequently observed, than in old ones. (See Exfoliation.)

In the perceptible exfoliation, the dead portion of bone first becomes whitish and dry; after some time it begins gradually to raise itself, and yields a sort of hollow sound, when struck upon with a probe; at length a fissure is formed in the circumference of the dead part, which separates the dead from the living portion of the bone. This fissure gradually becomes wider, and at the same time the piece of bone becomes more and more elevated; new flesh is found between the living and dead bone, which as it rises separates the dead portion, until at length it grows loose, and finally falls off. The bone beneath is then found covered with granulations which in some degree supply the place of the lost portion of the bone, and in time become osified.

The exfoliation is entirely a work of nature, but the surgeon must promote it. He must first endeavour to remove the internal cause of the caries; then if the exfoliation be judged inevitable, destroy completely the life of the diffused portion of bone, and promote its separation. The internal causes of caries are to be removed in the same manner as those of ulcers. Externally may be applied warm brandy, and various tinctures prepared with it. The diffused portion of the bone is to be kept constantly wet with pieces of lint dipped in spirituous liquors. But when the diffused portion of bone is so thick and firmly that it cannot be penetrated by these fluid applications, another mode of treatment is necessary. There are three different methods according to which we may proceed; but, of these, that which is most adapted to the peculiar circumstances of the case must be chosen.

We may either burn the bone by applying a red-hot iron, or we may bore a number of holes, the more the better, (by means of a perforator or small trephine), but so as never to pierce the sound portion; in order that the above-mentioned remedies may be able to penetrate into and entirely dry out the bone; or we may remove, by means of a scraper, so much of the bone, that the remaining layer may easily be penetrated by drying remedies. It is however well to be attended to, that when the life of the bone is entirely destroyed, the drying remedies should no longer be employed.
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as they then will answer no purpose, and at the commencement of the exfoliation will even be hurtful. Moreover, these remedies should come into contact with the whole circumference of the diseased portion of the bone, but (if possible) not with any of the sound part.

The first of these objects must be attained by laying bare the whole diseased portion of the bone by means of incisions; and the second, by not laying the bone bare further than it is diseased, or by covering the denuded found portion with lint spread with some emollient ointment, also by not inuring the lint with too large a quantity of the drying remedies as will come into contact with the found parts, and by not using these remedies longer than is necessary. It is also particularly requisite, when a red-hot iron is to be applied, that the carious part should previously be well dried out, in order that the heated fluid may not come into contact with and destroy the found portion of the bone.

As soon as the life of the diseased portion of the bone is completely destroyed, the surgeon usually employs such remedies as promote the exfoliation, suppuration, and growth of the new flesh; such, for example, as the ball, Ascaris, either alone, or mixed with a little oil of turpentine, the ung, albae, or refine fibre, &c. These remedies are applied warm; but in order that they may be able to penetrate to the living part of the bone, holes are bored into different parts of the diseased portion with the perforator; and the more numerous and large these perforations are the better. Every hole, however, ought to penetrate as far as the living part, and we are directed by many surgeons to continue boring till some blood appears. As soon as this has been done, the bone must be covered with warm emollient applications. Should the exfoliation not take place under this treatment, we may conclude either that the diseased portion of the bone is not entirely deprived of its life, in which case the application of the drying remedies must be repeated, or the cure is impeded by some internal cause, which must be discovered and removed. When the diseased bone begins to grow looser, it will be proper to shake it gently from time to time, without exciting, however, either pain or bleeding, in order to accelerate its separation; and when the exfoliation has been completed, the ulcer is to be treated like a simple, clean abscess.

A much more speedy and perfect cure, however, may be effected when the surgeon performs the separation himself. This is particularly necessary when the diseased portion of bone is very thick; but it is only admissible, when we have a free and unobstructed access to the whole circumference of the diseased bone. According to the difference of the situation and form of the bone, the separation of it is performed in different ways. When only a thin layer of bone is diseased, it may be scraped off with the scraper, or with the exfoliative trepan, or still more conveniently with a piece of glass. A thick layer of bone is to be separated with the chisel and hammer; and that this may be done without using great force, or producing a violent concussion, the bone must be previously bored through with the perforator; we must allow only attempt to chisel off small pieces at a time; and that the whole of the diseased portion has been removed, we may know by the whole surface of the bone becoming red and bloody. When the bone is flat, and diseased through and through, we may apply the trepan, and in cylindrical bones we may sometimes saw off the diseased portion. A bone that is diseased throughout must be extracted. As soon as the whole of the diseased portion has been separated the remaining part is to be treated like a simple wound, and the bone is to be dressed with emollient warm applications, under the use of which it generally becomes covered with flesh in a short time. In order that it may not again become diseased, it must be carefully defended against the cold, air, and spirituous substances. In many cases the surgeon cannot remove the whole of the diseased portion of the bone, and in this case he must combine the two methods of cure with each other; that is, he must remove the greater part of the diseased bone, entirely destroy the life of that which is left behind, by the application of the remedies formerly mentioned, then perforate according to Belofie's method, and dress the part with emollient applications.

The method of cure in the humid caries is nearly the same as that used in the dry; only in the former it is necessary that the discharge should be diminished, its condition improved, and at length that it should be dried up; since, till that has been done, no exfoliation can take place. If it proceeds from an internal cause, this must, if possible, be removed. Thus a cure is frequently obtained; however not always, for often the caries remains in consequence of local causes, in which case it must be treated as a local diseased. In such a case the surgeon must promote the evacuation of the matter by every means in his power; he must lay the bone sufficiently bare by means of incisions; the limb must be kept in a dependent position; and the ulcer covered with light dressings, in order that the thinner part of the discharge may run through; and in general every thing which might occasion a stagnation and accumulation of the matter in the ulcer must be most carefully avoided. But when the bone swells, and a quantity of matter is discharged from the ulcer, disproportionate to its apparent magnitude, so that we have reason to conclude the matter fluctuates in the fungous substance, or hollow of the bones, and there carries on its ravages in secret, the bone must be laid open in time by means of the trepan or perforator. Moreover, in all cases of humid caries, it is very useful to dress the ulcer with sponge or dry lint.

When the caries penetrates deep into the bone, we may apply spirituous tinctures and fomentations externally; but in using these remedies, the directions which we have formerly given are to be observed.

Of the internal remedies which contribute to improve the condition of the discharge, fala foetida has been recommended in the form of pills as one of the most efficacious; as it generally deprives the matter in a few days of all its fetor and acrimony, and thus sometimes is alone sufficient to produce the exfoliation and cure. In obstinate cases of caries, good effects have been produced by the use of time-water, hemlock, oak-bark, cinchona, and opium taken freely; but we are, nevertheless, too often disappointed in our expectations from medicine, and no one plan will be efficient in all such cases. And, whatever plan may be adopted, it will beat the same time particularly necessary to breathe a pure air, and use an appropriate diet.

When the cause of the caries has been removed, and the condition of the discharge improved, the exfoliation and cure are sometimes promoted by the judicious application of a bandage to the part.

Should the means that have already been mentioned be found inadequate to produce the desired effect, the surgeon is obliged to have recourse to more powerful ones; in order thereby to convert, as it were, the humid caries into the dry, and to accelerate the exfoliation and cure; for this purpose a red-hot iron is often our only reliance. As an excellent remedy against caries, Mr. Lentin recommends phosphoric acid, prepared according to Green's method. One part of this to be mixed with seven parts of distilled water, and applied to the bone itself, or used as an injection. Internally, the pure phosphoric acid has been administered, in doses of 1 C, 1 G, to 20 drops, three a day, in water, or a liniment.
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Sometimes Mr. Lenfant added a little myrrh to it, for external
application; or mixed the phosphoric acid with an infusion
of fumice, leadtum, or earl. laeias.

When the diseased bone is covered with much fungous
fluff, this must first be removed by means of cautious applica-
tions, in order that it may not obstruct the operation of the
red-hot iron on the bone. When the caries penetrates to
deep into the bone that the operation of the cantery does
not extend quite through it as far as the bone, a part of the
diseased portion may be removed with the ferper, or the
chisel and hammer. In flat bones, under which important
parts are situated, as, for example, the cranium, the applica-
tion of the red hot iron must either be omitted or performed
with great caution. When any of these means have been
applied to a sufficient extent, the surgeon must treat the dis-
order as a dry caries. If exfoliation does not commence within
the space of about 25 days, the remedies must be renewed.

Caries sometimes renders it necessary that the limb should
be amputated; namely, when a bone of one of the extremi-
ties is either entirely, or particularly at the joint, carious
through and through; and especially when the muscular and
more important parts are in a great measure affected by the
disease of the bone, and either correde or destroyed, as may
happen in what is named the Cancerous Caries. It has,
however, been observed, that, after this operation has been
performed, the disordered often breaks out in some other part, and
renders all medical assistance ineffectual. If, on the contrary,
the muscular parts have suffered but little, although the bone
is very carious, amputation ought not to be performed; but
all that the surgeon can and ought to do, will be to lay bare
the whole of the diseased bone by excisions, and to separate it
from the soft parts with the scalpel, and from the founded
portion of the bone with the saw. In these cases, nature some-
times supplies the portion of the bone that has been lost, and
though this should not happen, the operation above mentioned
is still preferable to amputation in this particular case.

Neither is amputation always admissible when the caries
proceeds from some internal cause, and this has not been
removed. It must also be avoided when the patient is already
greatly exhausted by the disease; however, the surgeon need
not be deterred by the mere presence of hectic fever; as this
arises principally from the irritation or absorption of matter,
and disappairs, together with its cause, after the operation
has been performed. It also happens, not unfrequently, in
cases of old caries, in which the constitution has become ac-
climated to the discharge, that troublesome symptoms super-
vene upon amputation, which perhaps may be prevented by
means of injections.

When the carious bone is covered with a great deal of
fungous fluff, defective remedies and prejudice must be
applied; and should these not prove sufficient to extirpate it,
we must use a humble, or the actual Cautery. In these
cases there is generally also some internal cause present, which
we must endeavour to remove by means of appropriate exter-
nal remedies. In that species of caries in which the bone is
converted into a kind of flaky substance, the internal and ex-
ternal use of lime-water has been found beneficial; the sur-
geon must, however, always attend at the same time to the
internal cause.

Concerning that species of caries which begins in the in-
ternal substance of the bone, see Syphilis and Necrosis;
and for the venereal caries, see Syphilis. Likewise,
concerning carious teeth, we refer to the article Teeth.
See also Epistaxis and the Spur.

Although we have here laid down the rules of practice,
which the gentiurny of surgeons follow in the treatment of
caries, it must still be acknowledged that no subject in the
whole compass of the art is more liable to obscurity and de-
bate. The modes of treatment adopted by one surgeon, will
be often regarded as either useless or pernicious by another;
so that while we are obliged to describe certain plans of
chirurgical management, it is with a full conviction that no
one method will be universally approved. The following re-
marks of M. Boyer, of Paris, are submitted to our readers, as
defering their attention, and as being among the latest
with which the public have been favoured by any systematic
writer.

"There is perhaps," says he, "no disease in which the
indications of cure are more vague than in caries, and none
in which the treatment is less regular. The ancient preferred
unctuous or relaxing applications, but they preferred acid irri-
tating substances, such as the powder of euphorbium, tincture
of aloes and myrrh, oil of turpentine, mineral acids, cali-
dical alkali, or even the actual cautery. Monro, Tenon, and,
in imitation of them, some modern practitioners, have pre-
dered the use of unctuous andeomulent applications; but, in order
to discover the preferable mode of treatment, it is neces-
sary to take a close view of the evil against which it is to be
directed. We must then consider, that a bone affected with
caries is a prey to a morbid action of its own parts, and that
this action creeps from one part to another, and pervades
the whole with greater or less rapidity, if art does not come to
the assistance of nature to arrest its progress.

"If the caries be produced by some affection of the system,
this should be ascertained and combated with appropriate re-
medies. Thus the use of mercurial and fuming medicines
arrests the progress of caries proceeding from the venereal
disease, and aids nature in separating the unbound from the
found part. The use of spirituous drinks, vegetable diet, and
acids, removes at once fever and the caries, to which it had
given rise, &c. &c. But if it has been occasioned by an ex-
ternal caufe, or if it has remained after the internal one has
been removed, so as to be reduced to the state of a mere to-
pical affection, its progress may be arrested, and the separa-
tion of the diseased parts facilitated by the use of such sub-
stances as fumiate the parts, or such as absorb and neutralize
the fluids which tend to propagate the morbid action. Thus
the defection of a carious ulcer has been effectual by the use
of an absorbing powder and pledges of lint that had been
dipped in tincture of aloes and myrrh.

"If these remedies be found inefficual, recourse must be
had to more active ones: a pledge of lint dipped in a solu-
tion of nitrate of silver, may be applied on the carious part,
and renewed every day. This portion of the bone is by this
means quickly dried up, and reduced to the state of a simple
necrosis; the propagation of the morbid action is arrested,
and nature effects a separation of the diseased parts.

4. If the caries be very humid, that is, if a great quantity of
fumes flow from it, these remedies, even the mercurial nitrate,
will be of no effect. The fumes will induce the neglect, and
abate the cautery so much, that its action is considerably en-
feibled. Caustic paraffin would be subject to the same incon-
veniences. In these cases, the actual cautery is a remedy to be
preferred to all others: by its action the carious part is
incised, to which reduced to the state of an inorganic dry sub-
stance, and the caries thus converted into necrosis. This
remedy is applicable to every case of humid caries where the
surrounding soft parts have not a manifest tendency to cancer.
Sometimes, however, the soft parts surrounding a carious
bone have that tendency in so advanced a degree, that the
actual cautery would necessarily occasion the development of
that morbid state. The general rules to which the use of the
actual cautery may be reduced are as follows:

5. In the first place, all the carious part of the bone must be
laid bare, whether by cutting away the soft parts, or destroy-
ing them by cautery. The latter method being tedious, in-
convenient, and uncertain, should not be used unless when the
patient will not submit to the use of the knife. The bone
being in this manner laid bare and scraped, the surgeon pro-
vides himself with several cauterizing irons of the same form,
because the application of one is seldom sufficient. It will al-
so be necessary to provide a number of caules when the cautery
is to be applied on a bone from which the soft parts
cannot be completely raised, as, for instance, on the os co-
cocygis, or sacrum: by means of these caules, the hot iron
can be introduced without injuring the soft parts. In every
case it will be necessary to protect the surrounding parts as
much as possible from the action of the cautery.

6. The iron, whatever may be its size, should be heated
white, as the hotter it is the more rapid and less painful is
its action. On the instant of its application, a black thick
smoke rises from the surface of the burning bone, the smell
of which resembles exactly that of burning horn: the great
quantity of fumes quickly diminishes the heat; for which
reason a second is to be immediately applied with the same
precautions; and a third, if the two preceding have not
burned deep enough. Care should be taken to extirpate
the diseased by burning every part that is affected; and if the
use of the cautery has not always had the success expected
from it, the failure of it is to be attributed to the timidity of
the operator. A carious bone becomes worse by the appli-
cation of the actual cautery, if the evil be not entirely
rooted out; just as a cancerous tumour becomes irritated,
and makes a more rapid progress, if imperfectly cau-
terized.

The actual cautery acts by evaporating the noxious
fluids in which the carious bone was immersed; by chang-
ing the caries into necrosis, and by irritating the sub-
jacent, found parts, and exciting that action of the ve-

icles by which the dead part of the bone must be thrown off.

7. It is almost superfluous to remark here, that this ope-
ration cannot be undertaken with any hope of success, if the
internal cance of the caries will exist." - Bayer's Dicæases

CARIGE, in Ancient Geography, a town of Italy, on
this side of the Ganges. Ptolemy.

CARIGNAN, in Geography, a town of France, in the
department of the Ardennes, and chief place of a canton,
in the district of Sainte-Menehould. Formerly a proprietory,
called "Joye," belonging to the dukes of Luxembourg, the
dukes of Burgundy, and the house of Austria, but at length ceded
to Louis XIV., who changed the name, and erected it into a
duchy; three leagues E.S.E. of Sedan. The place con-
tains 17,000, and the canton 10,923 inhabitants: the territory
comprehends 225 kilometres and 27 communes.

CARIGNANO, a town of Piedmont, in the district of
Savigliano, and capital of a principality, to which it gives
name, seated on the Po, over which it has a hardstone
bridge. It gives the title of prince to a collateral branch of
the house of Savoy. This town was plundered and
burned by the French in 1556, and in 1544, the fortifica-
tions, except the citadel, were razed, and most of the
churches destroyed. It is about 15 miles S. of Turin. N.
latt. 44° 32. E. long. 7° 25'.

CARIGNANO, a town of the island of Sardinia; 15 miles
W.N.W. of Terra Nuova.

CARIGUE, an island in the river Shannon, on the coast
of the county of Kerry, Ireland, opposite to Scattery
Island. Near it are the ruins of Carrigfoil castle, once
a place of great strength, the lands belonging to which were
granted to Trinity College, Dublin.

CARIGUEIA, in Zoology. See Didelphis Opossum.

CARIGUEIBUR. See Mustela rufescentis.

CARILL//E, in Ancient Geography, a town of Italy,
mentioned by Silius Italicus, and supposed to belong to the
Picentini, who inhabited the district now called Principato
Citra.

CARILLONS, a species of chimes frequent in the Low
Countries, particularly at Ghent and Antwerp, and
depicted on a number of bells in a belfry, forming a complete feries
of scales, of tones and semitones, like those on the harps-
ichord and organ. There are pedals communicating with
the great bells, upon which the carillonneur with his feet
plays the bale to sprinkle air, performed with two
hands upon the upper species of keys. These keys are pro-
fected flocks, wide enough slender to be struck with vi-
ence and velocity by either of the hands edgeways, without
the danger of hitting the neighboring key. The player is
provided with a thick leather covering for the little finger
of each hand, to guard against the violence of the stroke.
These carillons are heard through a large town.

Carillon is likewise the name of a small keyed instrument
to imitate a peal of hand bells. The tones are produced by
box hammers striking iron bars of different lengths. Handel
used to accompany his air in Milton's Allegro, "Or let the
merry bells ring round," on this instrument. And in Saul,
the chorus "Welcome, welcome, mighty king,"

CARILLONEUR, the musician who plays the caril-
lons, or chimes with hands and feet; an officer of extreme
labour, peculiar to Holland and the Netherlands.

CARILLONEUR of Suffolk, in Ornithology, the chiming
thrush, Turdus tinninubularis.

CARILOCUS, in Ancient Geography, now Charlevi,
a town of Gaul, belonging to the Adui. Ptolemy.

CARIMCURIN, in Botany, Rhed. Mal. See Jus-
ticia echinata.

CARMINGOLA, Rhed. Mal. See Pontederia cin-
gartis.

CARMON, in Geography, one of the chief towns in the
kingdom of Yokor, which occupies the southern extremity of the
Cherifone, in the peninsula of Malay, or Malacca.
CAR

CARINUS, a chulter of islands in the Indian Sea, B. lat. 5° 43', E. long. 100° 15'.

CARIMPANA, in Baluny, Rhed. Mal. See Beorasa, Sus flabifepigia.

CARIM-TUMBA, Rhed. Mal. See Nifta, medi-bahita.

CARINA, a Latin term, properly signifying the keel of a ship, or that long piece of timber running along the bottom of a ship, from head to stern; upon which the whole structure is built, or framed.

CARINA is also frequently used for the whole capacity or bulk of a ship; containing the hull, or all the space below the deck. Hence the word is also sometimes used, by a figure, for the whole ship.

CARINA is also used in the ancient Architecture. The Romans gave the name carina to all buildings in the form of a keel, as we shall give the name sacre to the middle or principal vault of our Gothic churches, because it has that figure.

CARINA, among andinifius, is used to denote the spinu duri. As likewise for the librun rudiments, or embryo of a chick, appearing in an incubated egg. The carina consists of the entire vertebrae, as they appear after ten or twelve days incubation. It is thus called, because crected, in form of the keel of a fish.

CARINA, in Baluny, Eng. keel. A name given to the lowest petal of a papilionaceous flower which generally envelopes the flamen and petals, in allusion to its shape, which has some resemblance to that of a boat. It sometimes consists of two distinct pieces, but is generally simple, attached to the receptacle, and firmly locked in with the other petals by two long claws. A leaf, a scale, and a nectary are also said to be carinated, or keel-shaped, when they are longitudinally hollow above, and have a corresponding, sharpish protuberance underneath.

CARINA is also used by some Chemifts, for the twentieth part of a drop.

CARINE were weepers, or women hired, among the ancient Romans, to weep at funerals: they were thus called from Caria, the country whence most of them came.

CARINA, in Ancient Geography, a town of Aes, placed by Ptolemy in Mada.—Alfo, a town of Aes Minor in Myfia, or in the Eolide; mentioned by Herodotus.—Alfo, a town of Aes, in Phrygia, towards Galetia. Pliny.—Alfo, a mountain of the island of Crete, which, according to Pliny, was nine miles in circuit.

CARINACOU, in Geography. See Caricou.

CARINANA, Carisen, or Sarignena, a town of Spain in Arragon, about 44 miles from Longaria, containing 2056 inhabitants, and two convents.

CARINANTHA, in Entomology. See Papilio.

CARINI, in Ancient Geography, a people of Germany, partly of those who were comprehended under the general name of Vandals, and whose habitation was near the Casanus Sinus. Pliny.—Alfo, a people of Germany, in the vicinity of the Helvetians.—Alfo, a people of ancient Britain, called Carniæ, which see.

CARIN, in Geography, a town of Sicily, pleasantly situated in a fertile valley, surrounded by high rocks, and in a well cultivated district, abounding in wine, grain of various kinds, olives, and all sorts of fruit. The town is singularly neat, contain 4000, (Sinburne,) or 7000, (De Non,) inhabitants, and gives title of prince to the family of Grus, who inhabit an old Gothic castle seated on a rock. It is distant one mile from the sea-shore, and 18 miles from Palermo. The adjacent territory produces a great quantity of excellent manna, as well as oil and wine. A long ridge, like a rampart, and some remains of a wall, are said to indicate the site of "Hieron," a city mentioned by Thucydides, as the birth-place of Laus, the most celebrated constern in Greek history, who was carried off when Nicias the Athenian general landed here in his way from Italy, plundered the town, and sold the inhabitants for slaves. Near the land, at some distance round the bay of Carini, lies the Isole delle Femine, formerly a place of banishment for criminals.

CARINISH Point, a cape of Ireland well of Bally-dunyan bay, in the county of Cork, and a little east of Durlies Island. It is more frequently called Carinish. N. lat. 51° 4', W. long. 10° 4'.

CARINOLA, a town of Naples, in the country of La vera, the site of a bishop, suffragan of Capua; 1 mile N. E. of Capua.

CARINTHIA, a duky of Austria, bounded to the east by Stria, to the north by the fame, and the archepiscopal of Salzburg, to the west by Tyrol, and to the south by the republic of Venice and Carniola. It derives its name from the ancient Carni, who were a colony of the Cetti, called in later times Carantani and Carniæ; and it was formerly a part of Carnia and Novium. The country is very mountainous and woody. Its principal mountain is the St. Ulrich, St. Helena, St. Veit, St. Lawrence, and the mountain of Lohi, which separates Carniola from Carniæ. There are also others, no less lofty, that incline towards Tyrol. These mountains yield very good iron; the iron-mines near Friesach on the north, and in the tract among the sprigs of the Lysers, being particularly famous. In the district of Villach are found rich lead mines, a beautiful blue granite, and fire marble, or lunachelli. The fertile dales of this country produce wheat and other corn, but not enough for the supply of the inhabitants. Carnithia has a number of lakes, the largest of which is that called Wordsee, eight miles long, and abounding in fish, and also many rivers, the principal of which are the Drau, issuing out of Tyrol, and traversing Carnithia from east to west; the Gail, the Moll, the Lysers, the Glen, the Gurk, and the Lavant. The cities of Carinthia, of which Clagenfurthe is the capital, are eleven; its market-towns 25; its villages, &c. 28,000; its houses 49,000; its convents 20; clergy 1010; nobles 386; burghers and tradesmen 4753; peasants 27,013; herds of oxen 50,000; peasants, with Upper Stria, 17,000. The inhabitants are partly defended from the ancient Germans, and partly from the Wends. The archbishop of Salzburg, and the bishop of Bamberg, have considerable territories in this country. The principal manufactures of the country are those of iron and steel. In 1528 the emperor Rudolph I. conferred this duchy as a fief on the count of Tyrol, who entered into a compromise with Albretch of Anria, by virtue of which, it was to descend, on the extinction of his male issue, to the heirs of Albrections; and when this happened, in the year 1331, the emperor Lewis of Bavaria recognized this duchy to the Austrian duke Otto, who, in 1335, was invested with it. The duchy is governed by a land-capitan; and to the military rate of the house of Austria it has been accustomed to contribute annually 657,695 florins. Christianity was introduced into this duchy in the 7th century; and the whole country acknowledges the Roman Catholic church, though it contains many protestants and adherents to the Lutheran doctrine.

Carinthia is divided into Lower and Upper. The principal towns of Lower Carinthia, are Clagenfurthe, the capital, St. Veit, Friesach, Volken, St. Andree, Wolfsberg, and Gurk; and those of Upper Carinthia are Villach and Gmuud.

CARINUS,
CARINUS, in Biography, a Roman emperor, was the eldest son of the emperor Carus, who, soon after his father's election, in the year 282, was admitted, together with his brother Numerian, to a participation of the imperial power; and both, being arrived at manhood, were honoured with the title of Caesar. Carinus was extremely viscious from his youth, and devoted to dissolute pleasures. He was, however, valiant and active; and, therefore, when his father departed for the prosecution of the Parthian war, the young prince was directed, first, to suppress some troubles which had arisen in Gaul, and afterwards to fix the seat of his residence at Rome, and to assume the government of the western provinces. Upon the death of Carus, near the close of the year 283, the two young princes, Numerian and Carinus, were unanimously acknowledged as Roman emperors. Born and educated in a private station their sudden elevation required an uncommon share of virtue and prudence; but Carinus was singularly deficient in these qualities. On his arrival at Rome from the Gallic war, he abandoned himself to the luxury of the capital. He blended in his character effeminacy with cruelty, a love of pleasure with a gross and indolent spirit, and an indifference to public virtue with consummate vanity. In the course of a few months he successively married and divorced nine wives, none of whom he left pregnant; and whilst he wallowed in the grovelfest pleasures, he beheld with incredulous horror those who might remember his former obscurity, or confude his present conduct. He banished, or put to death, the friends and counsellors of his youth; and whilst he affected an arrogant and regal demeanour among the senators, he selected his favourites, and even his minillers, from the dregs of the populace. The palace, and even the imperial table, were filled with fenders, dancers, prostitutes, and all the various retinue of vice and folly. Before the death of his father, the conduct of Carinus had filled him with shame and regret, and he determined to let him abide, and to adopt in his place the brave and virtuous Constantius, who was at that time governor of Dalmatia. But the sudden death prevented the execution of his purpose, and afforded his worthless and degenerate son an opportunity of displaying to the Romans the extravagancies of Elagabulus aggravated by the cruelty of Domitian. The unrestricted profusion with which he indulged his propensities to every kind of pleasure, supplied him with the means of exhibiting the Roman games of the theatre, the circus, and the amphitheatre, with uncommon splendour; and the vast prodigality which he manifested in this way was enjoyed by the Roman people with surplafe and transport. Upon the death of Numerian, Diocletian was elected emperor by the Roman army, assembled at Chalcedon; and the new emperor, fully apprized of the general dissatisfaction occasioned by the conduct of Carinus, made preparation for a civil war. In the spring of the year 283, the forces of the East and West encountered each other in the plains of Margus, a small city of Maesa (now Servia), in the neighbourhood of the Danube. The Eastern army had been reduced in number, and its strength had been exhausted; so that it was not in a condition to contend with the legions of Europe. Its ranks, on the right wing, were broken, and Diocletian despaired of the purple and of life. But the advantage which Carinus had obtained by the valor of his soldiery, he fonl low by the idleness of his soldiers. A slave, whose wife the licentious emperor had seduced, feized the opportunity of revenge, "and by a single blow, (says Gibbon,) extinguished civil discord in the blood of the adulterer." Crevier's Rom. Emp. vol. ix. Gibbon's Hist. vol. ii. chap. 12.

CAROLEE, a name given by the Canadians to a fledge, by which they transport themselves over the same, from place to place, in the most agreeable manner, and with a degree of velocity that appears almost incredible; for, with the same horse, it is possible to go 50 miles in a day, as light is the draft of one of the carriages, and so favourable is the snow to the feet of the horse. This cariole will hold two persons and a driver, and is usually drawn by one horse. Its shape is varied according to the fancy and taste of the owner. Some are open, and others covered. The former is commonly like the body of a curricle, put upon two iron runners or rods, similar in shape to the rim of a pair of skates; the latter consists of the body of a chariot put on runners in the same manner, and entirely covered with fur. The cariories glide over the snow for forty yards and with so little noise, that it is necessary to have a number of bells attached to the harness, or a person continually flowing a horn to guard against accidents. The rapidity of the motion, and the sound of these bells and horns, conduct much to cheerfulness, for you seldom see a dull face in a cariole. Wild's Travels, vol. i. p. 362.

CARIOPHYLLUM, in Botany, one of the synonymous names of madrepora, frigidula, Glas. CARIS, the flate of a bone purched or rotten. See CARIPI.

CARIPI, a kind of cavalry in the Turkish army. The caripoi, to the number of about 1000, are not slaves, but bred up in seraglios or fneminiaries, like the reft; but are generally Moors, or renegado Christians, who, having followed their fortune, and being poor, and having their fortune to seek, by their dexterity and courage have arrived at the rank of horse guards to the grand signor. Their march with the Unfiga on the left hand behind him; their pay is twelve apers per day.

The word carpi signifies poor and stranger; an appellation paid by the Chalcondylas to have been given them, because chiefly brought out of Egypt, Africa, &c.

CARIPOUS, in Geography, a people of South America, inhabiting a country to the north of the river Amazon, who are at perpetual war with the Caribbees.

CARIS, in Ancient Geography, now le Cher, a river of Gaul, called also Carus.—Alfe, one of the names of the isle of Coz.—Alfe, a town of Phrygia. Steph. Byz.

CARISSIPIC, in Geography, an ancient castle in the isle of Wight, near Newport, where king Charles I. was imprisoned thirteen months. It has a governor and a garrison.


Gen. Char. Cal. very small, five-elept, acute, permanent. Carp. montepetalous, funnel-shaped; tube much longer than the calyx, cylindrical, somewhat ventricose at the throat; border five-elept, spreading; segments oblong, acute, shorter than the tube. Stam. filaments five, very short at the top of the tube; anthers oblong, within the throat. Petl. gern superior, roundish; hyale thread-shaped, the length of the tube; stigmas thickish, slightly bifid. Petalae, berry somewhat globular, small, twocelled; peritnym thin, membranous. Seeds solitary, or two together, egg-shaped, somewhat compressed.


C R A R

Pl. 118. fig. 1. (Echites spinosa, Burm. Ind. 69. Carandas, Rumph. Amb. vii. p. 57. tab. 25. Lexicam Malar- basicum, Philk. Alm. tab. 305. fig. 4.) *Leaves ellipti-
tical, obtuse.* Linn. *Leaves egg-shaped, mucronate, reticu-
larly veined; segments of the corolla lanceolate.* Willd. A shrub. Stem fifteen feet high, much branchied; branches generally furnish'd at their knots with flat, fliff, opposite, spreading spines, often simple, sometimes bifid, not perfectly axillary. Leaves opposite, entire, foonath, a little coriaceous, on very short petioles. Flowers white, resembling those of the common jasmine; peduncles generally trifid. Berry dark red. of a pleasant acidulous flavour. La Mareck, from a dried specimen. The specimen from which Willdenow formed his description has mucrone leaves; but in La Mareck's figure they are perfectly obtuse and entire. A native of the East Indies, where it is made into an excellent sweetmeat. Lauriero found, on the east coast of Africa, a plant which he supposes the same; but, if his description be accurate, it must not be a different species, but will require a small alteration in the generic character. It is a small tree, about six feet in height, with twilled, spreading, dichotomous branches; branchied, more simply, dichotomous flowers; egg-shaped, acute leaves, and a one-celled berry, containing many roundish im-
bricated seeds. 2. *C. falciata,* Linn. Enum. and Illfitt. *Leaves lanceolate, oblong, mucronate, growing narrower towards the petiole.* A shrub. Leaves smooth, shining, veined, only half as broad as in the preceding species, and resembling those of the almond tree; petioles longer. Spines opposite, oblong, simple, spreading horizontally. Flowers smaller. A native of the East Indies, communicated by Somerat, but perhaps only a variety. 3. *C. spina-
narum,* Linn. Mant. 539. Linn. III. pl. 118. f. 2. (Spina spina-
narum, Rumph. Amb. vii. p. 76. tab. 19. fig. 1.) *Leaves egg-
shaped, acute, veined; segments of the corolla lanceo-
late-oblong.* A shrub, five or six feet high, much branchied, spreading. Branches slender, cylindrical, dichotomous, some-
what zig-zag. Spines in pairs, opposite, generally simple, sometimes bifid, situated at the bifurcations and knots of the stem. Leaves scarcely an inch long, resembling those of the myrtle, opposite, egg-shaped, acute, entire, coria-
ceous, smooth, shining above, finely veined, on very short petioles, so as to appear nearly fleshy. Flowers terminating, from two to five together on each petiole; tube of the corolla red, cylindrical, a little fleshy at the middle; border white, spreading; segments five, lanceolate, acute. Berry blackish, about the size of a pea, egg-shaped, two-celled. Seeds two in each cell, elliptical, convex on one side, flat on the other. La Mareck. A native of the East Indies. Lauriero found a plant in Cochinchina, which he suppos'd to be the same, and for which, in conjunction with another observed by him in Africa, he formed a new genus. But it differs so much, not only from the description of Linnaeus, but also from that of La Mareck given above, which was taken from dried specimens both in flower and fruit, that it must be a different plant. See STIGMARIA. 4. *C. edulis,* Willd. 3. (Antura, Forikal. Drefe. 63.) *Leaves egg-
shaped, acute, without veins; branches villous near the top; segments of the corolla lanceolate-linear.* A native of Arabia Felix. 5. *C. arduina,* Linn. Enum. and Ill. (Arduina bifiponita, Linn. *Leaves heart-egg-shaped, mucronate, nearly without veins, evergreen; spines bifid at the tip. See ARUDINA. La Mareck is the first who ob-
erved that the arduina and carifia of Linnaeus are properly one genus, to which opinion Juffien has acceded.


CARIBA, in Ancient Geography, a town of Abia Minor, in Phalagia. Pliny and Pudency. CARIBIA REGIA, surnamed ARCELIA, a town of Spain, in the department of the Gades. The ruins are found in a place called Cariba.

CARISSIMI, in Antiquity, a quality or appellation given by the emperors of Constanitople to presidents, governors of provinces, and others.

CARISSIMI, GIACOMO, in Biography, a Roman musical composer of the 17th century, whose productions were not only the delight of his contemporaries, but are still sought and hoarded by the curious as precious relics. He was, very early in life, appointed maestro di capella to the German college at Rome, in preference to all other candidates. Alberto della Valle, an excellent judge of music, speaking of the compositions of Carissimi, which he heard at the vespers performed on Easter Monday, by the nuns only, at the church dello Spirito Santo, in florid music, with such perfection as he never in his life had heard before; and on the last Christmas eve, in attending the whole service at the church of St. Appollinare, where every part of it was performed agreeably to its solemn an occasion; though, by arriving too late, he was obliged to stand the whole time in a very great crowd, he remained there with the utmost pleasure, to hear the excellent music that was performed. In the beginning, he was particularly enchanted by the Venita exultemus, which was more exquisite than words can describe. "I know not," says Valle, "who was the author of it, but suppose it to have been the production of the Maestro di Capella of that church." There was no matter in Italy at this time, 1640, whose compositions this description will so well suit, as those of the admirable Carissimi, who was now, in all probability, the Maestro di Capella in question; though so young, that his fame was as yet un-
fledged; however, it was in composing for this church that he acquired that great and extensive reputation which he enjoyed during a long life, and which his offspring, or musical productions, still deservedly enjoy.

Kircher, in his Musurgia, (tom. 1. p. 693.) describes his music and its effects in terms of high panegyric; and speaks of him as a master then living, 1650, who had long filled the place of composer to the Collegio Apollinare with great reputation. He began to flourish about the year 1635, and, according to Mathebon, was living in 1672. His productions are very numerous, though it does not ap-
pear that he ever composed for the theatre.

His sacred and secular cantatas, and motets, have always had admission into every collection of good music. It has been often asserterd by musical writers that he was the inven-
tor of cantatas; but it has already been shewn, that these feme de camera, or monodies, had a more early origin. Carissimi, however, must be allowed not only the merit of transferring the invention from the chamber to the church, where he first introduced cantatas on sacred subjects, but of greatly improving recitative in general, rendering it a more expressive, articulate, and intelligible language, by its approximation to speech and declamation.

Many of Carissimi's works are preferred in the British Museum, and in Dr. Aldrich's collection at Christ-church, Oxford.
There is something interesting in the most trivial compositions of this admirable matter, and in his works may certainly be traced more traits of fine melody than in those of any composer of the 17th century. Of twenty-two of his cantatas preferred in the Christ-Church collection, Oxon, there is not one which does not offer something that is still new, curious, and pleasing; but most particularly in the recitatives, many of which seem the most expressive, affecting, and perfect, that we have seen. In the airs there are frequently sweet and graceful passages, which more than a hundred years have not impaired. It is, however, in the divisions of this, and of all old music, that the time when it was composed, and the changes of taste, are chiefly discoverable. These are the fashionable forms and trimmings, which soon give way to others; but the principal ground-work, or materials, if good at one time, would not lose their value at another.

Besides Carissimi’s numerous secular cantatas, duets, trios, and four-part songs, his compositions for the church, where he first introduced instrumental accompaniments, discover more genius, elegance, and design, than those of any preceding or contemporary composer. Stradella’s untimely death perhaps only prevented him from writing as much, and as well, as Carissimi.

Kircher, the contemporary of Carissimi, after a jilt eulogium on his compositions in general, and telling us that he had the power of exciting in his hearers whatever affection he pleased, speaks of his oratorio of Jephtha, and the new and admirable effects produced in it by his knowledge of harmony, modulation, and happy expression of the passions. The chorus in his sacred drama, Floraire filia Israel, which follows the lamento della figlia di Jephte, is as remarkable for the accuracy of fugue and imitation, as for its expressive performance.

According to Mattheson, the famous German composer, Karl the younger was sent by the emperor from Vienna to Rome, in 1649, to receive lessons from Carissimi; who is said to have acquired a considerable fortune by the exercise of his profession, and to have lived to the age of 90.

He appears to have been the favourite composer and model of Dr. Aldrich, who was possessed of a complete collection of his works, which he frequently used in his own hand, and seems to have studied with great attention. And Purcell manfully formed his style on the productions of Carissimi and Stradella, particularly in his recitative and secular songs.

Carissimi was not only a man of superior genius and abilities, but a bold contrapunctist; as we find, in one of his masses, several new harmonies which were thought unwarrentable more than a century after his death, in 1672. He is much, and justly, praised by Kircher, in his Mufurgia; his compositions were greatly admired by Dr. Aldrich, who adopted English words to several of his movements in his masses, which were long performed in the chapel of Christ-Church college, Oxford.

In a mass, in the key of C, we have a 7th per saltum, unprepared, and unresolved on the 8th, the base descending a 3d.

The symphony in this mass resembles so much the overture style of Lulli and Handel, that primogeniture seems to entitle him, and not Lulli, to the invention. Lulli was born in 1633, and, in 1649, when Carissimi was celebrated by Kircher, and organist of the college Apollinare, Lulli was but 16.

Salvini says that this great contrapunctist, when he heard himself praised for his flowing, majestic, noble, and facile style of composition, used to exclaim: “Hah! how difficult it is to acquire this facility!” knowing so well the pains he had taken in acquiring it: and who, adds Signorelli on this passage, will deny that in the poetry of Metastasio, there is that natural flow and facility of which Horace describes:

Ut sihi quivis
Speret idem, judici multum, fructuosa lux, Ovius ibiam.

Beauty, in works of art, is acquired by great pains and labour, says an old Greek, Προσθέσον σας παλαιστικά. The gods fell to mortals whatever is excellent and beautiful, at the price of immense labour and sweat of their brows. Epicharmus, the comic philosopher.

CARISTI, in Ancient Geography, a people of Spain, placed by Ptolemy in the Tarragonenses, assigning to them the town of Tuscantium. M. d’Aville places them on the northern coast of Hispania Citerior.

CARISTIA. See CharisTia.

CARISTO, Castle Riso, in Geography, a town of European Turkey, in the island of Negroport; the see of a Greek bishop. Suffragan of Negroport. It is situated at the southern extremity of the island; 54 miles S.E. of Negroport.

CARISTUM, in Ancient Geography, a town of Italy in Liguia, placed by Livy in the territory of the Scatilinates. It was little south of Dertona.

CARITAS. The poculum caritas, or grace-cup, was an extraordinary allowance of wine, or other liquors, wherein the religious at festivals drank, in commemoration of their founder and benefactors.

CARITHMI, in Ancient Geography, a people of Germany, placed by Ptolemy between the Vantiones and the Vibes.

CARITY, in Geography, a river of Scotland, which runs into the Elke, in the county of Forfar.

CARIUM, or Curium, in Ancient Geography, a place in the island of Cyprus, where was the foret of Apollo.

CARIUSS, or Corius, a river of Asia, in Carmania, the mouth of which is placed by Ptolemy near the Persian gulf.

CARIUS, in Mythology, an epithet of Jupiter among the Milesians, probably appropriate to the worship of the Carians.

CARK, or Carke, in Commerce, a certain quantity, or measure, of wool equal to a thirtieth part of a sarl. Car.

CALK. See Chur.

Carl Gustavus, or Eschilstuna, in Geography, a town of Sweden, in the province of Svedama; 54 miles W. of Stockholm.

CARLAT, Le, a town of France, in the department of the Arrigie, and district of Mirepoix; 22 miles N. of Tarascon.

CARLAT, a town of France, in the department of the Cantal; 5 miles S.E. of Aurillac.

CARLENTINI, a town of Sicily, about 2 miles from Lentini, containing 3000 inhabitants, built by Charles V. with a view of making it the head-quarters of his troops in Italy, and almost ruined by an earthquake. It was placed on an eminence to be out of the reach of the uninhalome vapours of the marshes. The housetes are so low, that the streets still resemble a camp.

CARLEPONT, a town of France, in the department of the Oise, and district of Compiegne; 4 miles S. of Noyon.

CARLETON, George, in Biography, a learned bishop in the 17th century, was born at Norham in Northumberland, in 1559, and was chiefly indebted for his education, first in grammar learning and afterwards at the University of Oxford, to the care and liberality of Bernard Gilpin. After
having continued many years in the university, where he distinguished himself as a logician, orator, and poet, and more especially as a divine, he was advanced, without any previous ecclesiastical preferment, to the bishopric of Landaff, to which he was elected in 1617, and consecrated in 1618. In this year he was sent by king James I. to the synod of Dort, and took an active part in the defence of episcopacy. Having given satisfaction by his conduct on this occasion, he was immediately on his return, in 1619, promoted to the See of Chichester, where he remained till his death in 1628. He was a person of bold judgment and various reading, and tried by Camden for his proficiency in divinity, and in other polite parts of learning. To the Papists he was a bitter enemy, and with regard to the doctrine of predestination a rigid Calvinist; he wrote several books both in Latin and in English, of which the principal are his "Heroici Characteres," or Heroic Charactexs, Oxon. 1607, 4to; "Pythes examined, and proved to be due to the clergy by a divine right," Lond. 1616 and 1611, 4to: "Jurisdiction royal, episcopal, papal, wherein declared how the Pope hath intruded upon the jurisdiction of temporal princes, and of the church," Lond. 1616, 4to: "Concilium Ecclesiae Catholice contra Tridentinos, de Scripturis, ecclesia, fide, et gratia," Lond. 1613, 8vo. "A thankfull remembrance of God's mercy," Lond. 1614, which passed through several editions; "Antiromanism" against judicial Althology, Lond. 1624, 4to; "Vita Bernardi Gilpinii," Lond. 1626, 4to, published in English, Lond. 1639, 4to and 1636, 8vo. &c. &c. He was also concerned in the Dutch Annotations, and in the new Translation of the bible, undertaken by order of the synod of Dort, but not completed and published till the year 1637. The son of the bishop by his first wife, Mr. Henry Carleton, embraced the cause of the House of Commons in the civil war with King Charles I., accepted a commission in the parliamentary army, and shewed himself to be an enemy to the bishops. He was chosen representative for Arundel in Suffolk, in the short Parliament, which met at Westminster in 1640. Bp. of Brit.

CARLETON, DUDLEY, viscount Dorchester, an eminent flatman in the 17th century, was the son of Anthony Carleton, esq., and born at his father's seat in Oxfordshire in 1573. Having finished his education, at Wotton-under-Edge school and at Christ Church College, Oxford, he travelled abroad for further improvement. After his return, he became secretary to Sir Thomas Parry, ambassador in France, and in 1603 he occupied the same office in the house of the earl of Northumberland. About this time he was also gentleman of the privy chamber. In the first parliament of king James, he was representative of the borough of St. Mary's in Cornwall, and distinguished himself as an active member and an able speaker. In 1605 he accompanied Lord Norris into Spain, and at the close of this year he was summoned home under a suspicion of being concerned with his former patron, the earl of Northumberland, in the gunpowder-plot; and though on his arrival he was confined, he was very honourably discharged. In 1619, he was appointed ambassador to the court of Brussels, but that embassy not taking place, he was sent in the same capacity to Venice, and previously received the honour of knighthood. During this embassy, he established the character of an able negotiator, and was a principal agent in concluding a treaty between the kings of Spain and the duchy of Savoy. He was also instructed to invite the republic of Venice to accede to the league between the king of Great Britain and the protestant princes of the union in Germany; but his proposal was not accepted. Soon after his arrival in England from Venice, in 1615, he was appointed ambassador to the States-General; and in this capacity he spent the most active period of his life, from 1616 to 1628. He was the last who published the privilege of a seat in the council of state for the United Provinces, which queen Elizabeth had obtained for her ambassadors. Upon his arrival in Holland he was soon involved in the disputes between the Arminians and Calvinists, which then agitated that country; and the part he took in the politics which gave rise to the synod of Dort, excited his attachment to the Calvinistic cause and the public liberty of Germany. Many circumstances occurred in the course of this embassy which rendered his situation peculiarly difficult and trying; but during the progress of them he conducted himself with great firmness and prudence, although the disputes at home between Charles and his parliament, and their dislike to his favourite minister, the duke of Buckingham, thwarted many of the principal plans in which he was engaged. In 1624, Sir Dudley Carleton returned to England, and was appointed vice-chamberlain of his majesty's household; and, at the same time, he was joined with the earl of Holland in a negotiation at the court of France, which terminated only in partial success. Upon his return to England he found parliament much agitated by the mismanagement of public affairs; and being chosen as a representative for the borough of Hastings, he endeavoured to allay the ferment that occurred during the prosecution of his patron, the duke of Buckingham. His conduct, however, on this occasion, gave great offence to the friends and supporters of liberty in parliament; but it was very acceptable to an arbitrary court, and procured for him one of the rewards to which he aspired, a seat in the house of peers, by the title of baron Carleton of Kimberley, in the county of Surrey. Soon after, he was sent as ambassador extraordinary to France, for the purpose of exacting and justifying the dismission of the queen of England's French servants. In this unpleasant negotiation he manifested his usual prudence and adroitness. In 1627 it became necessary for him again to reform his character of ambassador in Holland; but he found the States-General very differently disposed towards this country than they were during his former embassy, nor was he admitted as he had before been into their councils, the ambassador from England having been deprived, by a particular resolution, of that seat in the council of state. He remained, however, in Holland, conducting a variety of interesting negotiations, till he was recalled in 1628. Soon after his arrival he was created viscount Dorchester, and secretary of state. In this capacity he was a principal agent in completing the treaties with France and Spain, and in conducting several foreign transactions, for which he was better qualified than for the internal concerns of the nation, which were now become very intricate and disordered. He seems to have been inclined to arbitrary maxims of government, and to have acquiesced in the dangerous measures of Buckingham, Laud, and others, which widened the breach between the king and parliament. He did not live, however, to witness the diabolical extremity in which they terminated; for having long struggled with the disorders occasioned by frequent returns of the House of Commons, he died in February 1631. He wrote a number of letters, speeches, &c., on political topics; but the most valuable of his remains is a series of dispatches, while abroad, from which a selection of "Letters to and from Sir Dudley Carleton during his Embassy in Holland, from January 1625 to December 1629," was published by Lord Hardwicke, in one volume 4to, in 1757, with an historical preface; a second edition appeared
CAR LIN, CARLIN, or CARLINE, in Commerce, a small silver coin, current in Naples and Sicily, equivalent to about four-pence English.


Gen. Ch. Calyx common dwelling, imbricated; scales numerous, loofe, acute; inner ones disposed in a circle, very long, spreading, glossy, coloured, forming a kind of ray to the common flower. Neaon monopetalous, funnel-shaped, equal, androgynous; tube slender; border five-clft. Stem. Filaments live, capillary, very short; anthers united into a hollow cylinder. Pfl. Germ short; style fimple, the length of the flaments; flagoz oblong, bifo or entire. Peric. none, except the permanent contracted calyx. Stcfts solitary, roundish; down divided into fomewhat chaffly, branched, and teathery rays. Recept. chaffy; chaff eif at the tip into fomeral fegments.

Eff. Ch. Calyx radiated with long, coloured, marginal feales.

tony and white on both fides, spreading widely on the ground. Flower fie from fix to fix inches in diameter; outer fcales of the calyx very fpinous; inner ones white above, purplifh underneath; receptacle thick and feffy. A native of dry fihills in Italy, Spain, Germany, and the fouth of France. 2. C. caulefcent, Lam. 2. Bauh. Pin. 380. Tourn. 500. (C. clariolus, Clafs. hif. 2. p. 155. C. accuris, Willd. 1.) "Stem one-flowered; flower rather large; leaves long, narrow, piniate, green on both fides; pinia gaifeed and toothed." Lam. Reeft perennial. Stem from fix to ten inches high, redcliff, slightly cotony, leafy, generally fimple and one-flowered. Leaues very long, efpecialy the lower ones, divided to the midrib. Flower terminal, considerably fmalier than that of the preceding species. A native of a fandy foil in fificlered situations on the Alpfs and other countries in Southern Europe. Lamninus confiderd thefe two plants as varieties of the fame species, as did alfo Haller and Scopoli, but Lam. MARCK afcerts that they are perfectly diftinct. Both of them have a fefhy receptacle which is eaten by the inhabifants of their native mountains, and is faid to equal that of the artichoke in flavour, while at the fame time it exceeds it in size. It is, however, not likely to rival that fefulent on the tables of the luxurifus, as it has been found not to flourifh in cultivated ground. The roots of both fpecies are aromatic, and are alfo used for food when young and tender, but in adult plants they acquire an acrimonious quality, and are then recommended as a diuretic, fudorific, and alepharmic medicine. The dofe of the root, when dry, is from one to two draufs; when fresh, from two draufs to half an ounce, but is more frequently given in a decoction than in fubftance. Allion. and Bofc. 3. C. aggregata, Willd. 3. Waldii. and

something of its ancient splendour, and was accounted a city." Soon after the Romans had quit the island, Carlisle was entirely abandoned to the northern invaders, and by them completely ruined and left waste. In this state of desolation it remained till the reign of Egfrid, king of Northumberland, who ordered it to be rebuilt, and accompanied it with a wall. He afterwards bestowed upon it the celebrated St. Cuthbert, who visited his new acquisition in the year 696, and, according to Bede, "was visited by the towns-people to see their walls, and a fountain, or well, of admirable workmanship, constructed therein by the Romans." St. Cuthbert was bishop of Lindisfarne; and by Egfrid's grant, Carlisle became an appendage to that see, and so continued till the year 1135, when Henry I. constituted it a separate bishopric. During the incursions of the Danes, in the eighth and ninth centuries, Cumberland was exposed to frequent ravages, and this city underwent its full share of calamity, for it was wholly consumed by fire; its inhabitants were massacred, and its walls overthrown.

"Its very foundations," says Dr. Todd, "were buried in the earth, so that, it is said, large oaks grew upon them; and this is not only attested by our historians, but also evinced by some discoveries that have lately been made of large unhewn oak trees buried ten or twelve feet below ground." In this desolate state the city remained nearly two hundred years, when Walter, a priest, and follower of William the conqueror, repaired a few of the ruined habitations, and attempted to re-establish a religious institution, that had either been founded by St. Cuthbert, or about the time: on this occasion the conqueror issued a mandate, that the inhabitants of Cumberland, but particularly of Carlisle, should be subject to the episcopal jurisdiction of Durham; from the predeceivers of whose diocefan they had received chrihrianity.

When William Rufus returned from his intended attack on Malcolm, king of Scotland, about the year 1094, he made a visit to this city, and perceiving its importance as a frontier station, gave orders that it should be completely restored, and entrusted the execution of his plan to the above Walter, under whose direction several public edifices were built, a strong fortress erected, and the whole defended by a wall of circumvallation. These buildings are supposed to have been raised by Flemish artificers, a colony of whom was settled here by Rufus, but soon afterwards removed to North Wales, and the isle of Anglesey, and its place occupied by a body of South Britons, who were directed to cultivate the neighbouring lands, and to teach the natives the art of rendering the fertility of the soil conducive to their subsistence. From this era, Carlisle may be regarded both as a military station, and a city, and for several centuries its vicinity to Scotland occasioned it to experience many vicissitudes. Having been ceded by Stephen to the Scottish king, David, about the year 1136, it was made a place of retreat by the latter, after his defeat in the dreadful battle of the Standard, in 1138; and here also he received the pope's legate, Alberic, by whose influence all the female captives that were brought into Carlisle, were set free. The chief object from the Scottish leaders a solemn promise, that in future incursions, they would spare the church, and withhold their swords from the aged, from women, and infants; an injunction which humanity dictated, but which the savage customs of the contending nations had not before admitted into the modes of warfare." Carlisle, from this period to the time of Edward I., was subjected to several disastrous events. The 35th year of that monarch, 1307, will be ever memorable in the annals of this city, from the parliament that met here January 20, and continued sitting till the Palm Sunday following, during which period several important acts were passed, and laws made to promote the expedition which the king was then meditating against the Scots. Edward remained at Carlisle till June 28, when he proceeded towards Scotland, but, being felied with a flux, expired at Burgh-on-Sands, on the seventh of the following month. In 1338, Carlisle was besieged by the Scots, and the suburbs burnt; as was frequently the case during the contentions between the rival houses of York and Lancaster. The wealth of the city was so much reduced by these repeated outrages, that Edward IV. consented to the inhabitants one half of the annual rent of 80 pounds paid to the crown, and also granted them the lordship of the royal fisheries at Carlisle. The war between Charles I. and his parliament once more involved this city in the horrors of a siege, and the general distress was increased by the calamity of famine. The blockade commenced October 9, 1644, and continued till the ensuing June, when the place surrendered to general Leffey, who commanded for the parliament. During the intermediate time, the wants of the inhabitants and garrison were so great, that not only horses, but even dogs and rats were eaten; and hemp-feeds were substituted for bread till a small quantity of the provisions was consumed; the city was then given up on honourable terms. The last occurrences of this nature, of which Carlisle was the scene, were those which accompanied the rebellion in 1745, when it surrendered, after a short siege, to the forces of the Pretender. The situation of Carlisle is extremely fine; it stands on a gentle rising ground, in the midst of extensive and fertile meadows, terminated by the diftant mountains, and watered by the Eden, the Caldew, and the Peurler. The two former of these rivers flow on different sides of the city; and their banks and contiguous meadows afford a number of pleasant walks to the inhabitants. In high floods in the winter feaon the low lands are sometimes inundated, and in the city those periods appears excessively wet, or often rising from the midst of a vast lake. The improvements that have been effected at Carlisle, since the union with Scotland, are exceedingly numerous. It was then more celebrated for the strength of its walls, and forts, than either for the neatness of its buildings, or the respectability of its inhabitants; but as the prospect of future commotions vanished, manufactures were introduced, and a taste for improvement accompanied the increas of wealth. This being attended with an augmented population, alterations and improvements were rapidly made. At the commencement of the last century, the dwellings of the inhabitants were mostly formed of wood, clay, and thats, exhibiting singular specimens of poverty and vitiated taste. The gables ended fronted the streets; and the diminutive windows, projecting porches, and clumsy oaken doors, fastened together with large wooden pins, corresponded in form with the gables. The streets were badly paved; and the gutters, or rather trenches, on each side, were so wide and deep, that small bridges were in many parts placed over them for the convenience of passengers. These obstructions have been removed; most of the houses have been rebuilt with propriety and even elegance, and many new ones erected in the modern style. Some very material improvements are now making in the entrance to the city. The space included within the walls is somewhat in the form of an irregular triangle; the buildings, however, extend considerably beyond those limits, but are chiefly spread in the vicinity of the city gates which are three in number, and respectively denominated from their contiguity to the English, Irish, and Scottish kingdoms. The English gate is connected with the building called the citadel, which is of an oblong shape, having a round tower at each end, with slender
flander openings for the discharge of arrows. These openings are singularly contrived, the apertures diverging outward, but gradually decreasing to the inner side, where they become narrower. The towers are low, but apparently of great strength; and, together with the gate-towers, were built by Henry VII. The city walls are principally formed of squared stone, and on the south and east sides supported by numerous buttresses. Various flights of steps lead to the top, whence the prospects are in many parts extensive and interesting. The public buildings are various; yet those which chiefly engage the curiosity of the visitor, are the castle, and the cathedral. These edifices, or at least certain parts of them, are of considerable antiquity, but have undergone many vicissitudes, and experienced various alterations.

The castle stands on the north-west angle of the city, and consists of an outward and inward ward. Within the latter is the great tower, dungeon, or citadel of the castle. This is of a square form, and very lofty, with walls of vast thickness, and constructed according to the modes of defence employed before the invention of cannon. It has since been strengthened according to the modern system, and defended by a half-moon battery and a very large platform, mounted with cannon under cover of the outward wall. The outer ward contains the governor's house; and is one of the gates of the castle the old portcullis is still remaining. This torture was made the prison of the unfortunate queen Mary, for some time after her landing at Wrotham, and the apartments wherein she was lodged are still shown.

The cathedral was erected at various periods, and displays specimens of different styles of architecture. Some part of it is apparently as old as the Saxon times, but the greatest portion is more modern. Several parts of the building are extremely beautiful; but on the whole it appears to much disadvantage, having “been curtailed of its fair proportion” in the civil wars, at which period about 30 yards of the nave was pulled down to erect guard-houses and batteries. The opening was afterwards closed with a wall, and the space within the wall, and the transept fitted up as the parochial church of St. Mary, as the entire west end had formerly been; and divine service is regularly performed in it.

The arches in this part of the cathedral, and in the transept, are circular, and the shafts extremely massive; the height of each being only 14 feet two inches, while the circumference is 17 feet and a half. The choir was begun by bishop Welton in the reign of Edward III., and finished by the succeeding bishops, Appleby, and Strickland. The expences were chiefly defrayed by subscription; and indulgences and remissions of penance were also granted to such of the laity as should by money, materials, or labour, contribute to the pious work; copies of various orders and letters patent granted for the occasion are preserved in the bishop's register. Several ancient monuments are remaining in the cathedral, supposed to be for the bishops Welton, Appleby, and two or three others, but uncertain for whom; and on the north side of the choir, near the altar, is a curious monumental brass plate, erected to the memory of bishop Henry Robinson, who was born in this city about the year 1556, and became celebrated for his piety and learning. The whole structure, and indeed most of the buildings in this city, are composed of a coate, but durable, kind of red freestone. Bishop Tanner remarks, that “this is the only episcopal chapter in England of the order of St. Aultin.” Before the dissolution of the monasteries, several religious houses were established in this city; and some few remain are yet visible. The cathedral itself seems to have belonged to a priory. The chapter-house and cloisters flow on the south side of the cathedral, but were pulled down during the civil wars. The only church in Carlisle, besides that of St. Mary's in the cathedral, is St. Cuthbert's; this is a plain modern building erected in 1728, on the site of the ancient structure, which appears to have been originally built before the destruction of the city by the Danes. The other edifices for religious worship are three meeting-houses for Quaker dissenters, one for Quakers, one for Methodists, and a Catholic chapel. The three principal streets range nearly in the shape of the Roman Y, and meet at the market place, where the town hall, moot-hall, and council-chamber are situated. Here the offices courts and quarter sessions are held, and most of the public business is transacted. The corporation records are also kept here; and the representatives for the city elected. In this diffused part of the kingdom, prisoners are frequently obliged to remain without trial several months, as the sentences are only held once a year. Near the gas are some buildings called charity houses, where decayed freemen, and widows of freemen, are permitted by the corporation to live rent-free. The poor are maintained in a workhouse erected by subscription about the year 1750; prior to that time, they were either formed out, or had a weekly allowance at their own houses. A dispensary was instituted July 1, 1782, for the relief of the indigent sick, and upwards of 15,000 persons are computed to have been relieved since its establishment. Carlisle has received many royal grants, and been invested with great privileges by different monarchs, but nearly all the original charters have been confirmed by the fires that have frequently defoliated the city. Charters of confirmation have been granted by Edward I., Henry V., and VIII., and every succeeding sovereign, to the reign of Charles I., who ordered some alteration to be made in the mode of electing the different officers. The city was first represented in parliament 25 Edward I.: the members are chosen by the free burgesses, who are about 700 in number. The population and buildings of Carlisle and its suburbs, have increased in a very rapid manner during the preceding century; but the augmentation has principally been made within the last 40 years. By the return made under the late population act, the number of houses was found to be 13,386, of inhabitants 10,221. In the year 1761 various new works were established; a company from Newcastle began the calico printing business which has progressively increased ever since, and now furnishes employment to many hundreds of men, women, and children. There are four print fields, which employ a thousand persons, and pay upwards of 20,000l. to the revenue annually. Besides these, there are eight other manufactories; and some of them execute every branch, from preparing the raw materials, to the completion of checks, calicoes, muffins, and all kinds of fancy-work. A brewery has been established, and three others have been lately erected; a wool manufactory has also been built; and so greatly has the trade of the city increased, that the duty paid on licences and exciseable articles amounts to more than 110,000l. yearly. Its growing importance is evinced by the establishment of two banks, both of which have been opened within a few years. Carlisle is 303 miles N.W. from London; and has two weekly markets, Wednesday and Saturday. Hutchinson's history of Cumberland, 2 vols. 410.

CARLISLE, the chief town of Cumberland county, in the state of Pennsylvania, North America, pleasantly and fabulously situated in the post-road from Philadelphia to Pittsburgh, 124 miles W. by N. from the former, and 178 E. from the latter. The town contains about 400 houses, chiefly of stone and brick, and about 1500 inhabitants. The streets intersect one another at right angles; and the public
public buildings are a college, court-house, and gaol, and four edifices for the public worship of the Presbyterians, Germans, Episcopalian, and Roman Catholics. Dickin-

son college has a principal, three professors, a philosophical apparatus, and a library consisting of about 5000 volumes. Its revenue arises from 4000l. in funded certificates, and 13,000 acres of land. N. lat. 46° 12'. W. long. 77° 12'.

CARLISLE Bay, a bay on the west side of the island of Barbadoes, in which stands Bridge-town, which see.—Alfo, a bay of the island of Antigua; three miles W. of Falmouth. —Alfo, a bay on the south coast of the island of Jamaica. N. lat. 17° 37'. W. long. 77° 6'.

CARLTON, s. E. of Lagrow, a bay, on the north coast of the island of Bermuda, or New Greenwich, in the Southern Pacific Ocean, between How's Point and Portland's Island. S. lat. 10° 42'. E. long. 164° 16'.

CARLOCK, CARLISLE, or CARLOCK, a provincial term sometimes made use of to signify the weed charlock. See Carlisles.

Carlisle, in Commerce, a fort of fish-glue, or fishflas, imported from Archangel. It is made with theurgeon's bladder; and is used for clarifying wine, as also in dying. The belt comes from Allaran, a city in Mufcowy, at the mouth of the river Wolga, where they catch great quantities ofurgeon.

CARLOMAN, in Biography, eldest son of Charles Martel, succeeded his father in 741 to the dominion of Austra-

fia. After many warlike expeditions, which were attended with success, and in which he displayed equal courage and ability, he conceived a disgust with the world, and deter-

mined on religious retirement. Accordingly, he made a

journey to Rome with a splendid retinue, and having in his own name, and in that of his brother Pepin, presented mag-

nificent gifts to the holy see, he received the clerical tonsure

from the hands of pope Zachary in 747. He afterwards

retired to a monastery on mount Sarzeau, where he became a monk of the order of St. Benedict; and withdrawing for
greater privacy to the abbey of mount Caffin, he spent his
remaining days in the offices of the convent, and the exer-
cises of devotion. He died at Vienne in Dauphiny in 775.

Carloman was also the son of Pepin the Short, and

younger brother of Charles Martel, and was consecrated at Soif-

fons, in 768, to the sovereignty of Austrasia, Burgundy, and part of Aquitaine. Being on ill terms with his brother,
a serious contetl between them was expected to have taken
place; but it was prevented by the death of Carloman in
771, which left his brother sole poiffessor of the French
monarchy.

Carloman was also the son of Lewis II., called the
Stammerer, and, in conjunction with his brother Lewis III.,
succeeded his father in 879. France was at this time dif-
tracted by intestine competitions for power; and whilst Car-

loman, affihled by his brother, was besieging Vienne, in a
contetl with Bolon, who had established the kingdom of
Aries, or Provence, Lewis was called upon to repel the
Normans, who made inroads on the northern side, and died
in 852. Carloman, in consequence of this event, was de-
clared king of France, and abandoning the siege of Vienne,
marched into Picardy, where with a sum of money he pur-
chased the retreat of the Normans. He was soon after-
wards wounded in hunting the wild boar, and died in 884, at the early age of 18, before the consummation of a mar-
riage, which he had contracted with a daughter of Bolon.

Carloman was also king of Bavaria, and in 876 suc-
ceeded his father Lewis I. king of Germany in the sovereignty of Bavaria, comprifing, besides that province, Boh-
emia, Moravia, Carinthia, Austria, Scavonia, and part
of Hungary. With the design of annexing Italy to his do-
minions, he marched his army into the country, but after a paral success in Lombardy, he was induced by a false alarm to abandon the accomplishment of his purpose, though he retained the title of king of Italy. He died of a pailly in 882. Mod. Un. Hist. vol. xix.

CARLONI, GIOV. BATTISTA, an eminent painter of history, was a native of Genoa, and having protected the

trained his art at Rome and in the school of Pagnigano at Florence, he became one of the most fertile, original, and

ferticulous minds of Italy. The most splendid works of this sort, and of his brother Giovanni, are the frescoes of the
cathedral of Cutiatato at Genoa, which exhibit a won-
ndetul effect of colouring. He survived his brother 59 years, and distingulished himself by this novel style in the church

collections of Liguria and Lombardy. His powers were very various; and he is said to have possessed equal facility in

oil and fresco, colour and design, velocity and correctness.

He had incessant employment, and was unrivalled in dili-

gence and perseverance. After a prolonged life of 86 years, he died in 1680. Pikkington by Fuseli.

CARLOS, in Geography, a feast on the north coast of

Terra Firma, situated on an island which commands the

channel between the gulf of Venezuela and that of Maracaybo

on the fourth, little more than 20 miles N. from the town of

Maracaybo.

Carlos, a town of Veragua, in New Spain, 45 miles

S.W. from Santa Fe, situated in a large bay, having a num-

ber of small and defert islands at its mouth. N. lat. 7° 46'.
W. long. 82° 16'.

Carlos, a town of North America, in the province of

Nicaragua, seated on a river which runs from the lake of

Nicaragua into the Caribbean Sea. N. lat. 11° 42'. W.
long. 69° 45'.—Alfo, a town of the island of Cuba; 62
miles E. of Havana.

Carlosa, a town, in the interior part of Brul, on the

south-east side of St. Francis river, and north by west

from Villa Nova. S. lat. 15°.

CARLOSTADIANS. See Carolstadians.

CARLOTTA, la, in Geography, a town of Spain, in

the province of Andalusia, built in 1769 for German and

Italian emigrants; 15 miles S. of Cordova.

CARLOVINGIANS, in History, the title by which the

French kings of the second race have been distinguished,

and which was first derived from Charles Martel, (see his ar-
ticle,) and commenced with his son Pepin in 752, and ter-
minated with Louis V. in 987. They reckon 14 kings of
this family. The mutual obligations, says Gibbon, (Hist. vol.
ix, p. 150; &c.) of the popes and the Carolingian

family, form the important link of ancient and modern,

civil and ecclesiastical history. On the part of the popes,
the most essential gifts which they conferred on the Carlo-
vingian race were the dignities of the kings of France, and

of patron of Rome. See Pepin and Carlomagno.

On the other hand, the gratitude of the Carolingians was
adequate to their obligations, and their names have been

consecrated as the favours and benefactors of the Roman

church. Her ancient patriomony of farms and houses was

transformed by their bounty into the temporal dominion of
cities and provinces; and the donation of the Exarchate,
(see,) was the first fruits of the conquists of Pepin.

CARLOW, or CATHARLOUGH, in Geography, a county in

the province of Leinster, Ireland, which lies between

Kildare on the north. Queen's county on the north-west,

Wicklow on the north-east, Wexford on the south-east, and

Kilkenny on the south-west and west. It is 26 Irish miles

(33 Eng.) in length from north to south, and 23 (29 Eng.)
Car

at its greatest breadth, but it narrows to the south in the form of a wedge. It contains 117,050 Irish acres, or 214 square miles, (220,008 acres, or 344 square miles English measure,) and 8763 houses, which, at five to each house, would give a population of about 44,000, which is certainly a moderate computation. The number of parishes is 52, none of which are wholly improper; but in confederation of unions they form only 17 benefices, all in the diocese Leighlin. Some idea may be formed of the religious state of the country from four of these benefices being without a church, and only one of them having a glebe house. The number of members which represent it in the imperial parliament are three, two for the county, and one for the town of Carlow. The river Barrow, which is navigable, runs through this county from north to south, and for many miles forms its western boundary. The woody hills which skirt the northern part present a beautiful and varied scenery. The river Slaney also conveys it in its passage from Wicklow to Wexford. That part of Carlow which lies on the east of the Barrow is covered with rough and high hills. Another mountainous tract continues all along the bounds of Wicklow, beginning at the north with the high and rocky mount Leinster, and terminating in that which is called Blackstairs. But the champaign country is very rich and fertile. When Mr. Young was in this county in 1776, he observed cultivation rising up the sides of the mountains; he found also that the hiring tenant was in general the occupier, and that the average rent of the county was 15s. per acre, which was about the average rent of the whole island. Rents, however, have probably risen considerably in consequence of the improved state of the country with respect to inland navigation. The mineralogy of the country is very imperfectly known, but from the account of Mr. D. Stewart, published in the Transactions of the Dublin Society, by which he was employed, there appears to be abundance of marl, lime-stone, gravel, great variety of clays, some of them light and foamy, some iron ore, and a great deal of oxied of manganese.

Carlow was made a county by king John during his visit to Ireland in 1210, having been before called Hydrene, and Hy-Cavanagh. It was part of the territory, of which Strongbow acquired the sovereignty by his marriage with Eva daughter of the king of Leinster, confirmed to him by king Henry as suprême lord of Ireland; and it was afterwards held by his descendants, the earls Marefchel. The principal towns are Carlow, Leighlin bridge, and Tullow.

The above article is chiefly taken from Dr. Beaufort's excellent memoir accompanying his map of Ireland; but Mr. Young's tour, and other works, have been consulted. No authentic account of Carlow has yet been published.

Carlow, a borough and port town, and the affixe town of the county of the same name, situated on the river Barrow. It was formerly called Catherloch, or Cathroch, i.e. the fortress in the late, and gave name both to the county and barony in which it is placed. It was early fortified, some say by king John, others by John Comlaile of Cheiller, and Hugh de Lacy, whilst the building of the castle is attributed to Eva, the wife, or Isabel, the daughter of Strongbow. It was certainly deemed of some consequence as a fortress, and therefore had its full share of the calamities which have for so many centuries devastated Ireland. It does not appear, however, to have been large. Boats speak of it with contempt, but it has since increased, and was, at the union, deemed worthy of sending a burgess to the imperial parliament. It has a manufacture of a coarse kind of wooden cloth, but it is not considerable. The junction, however, of the grand canal with the Barrow, and the improved navigation of the river, will probably occasion the further increase of the town. The appearance of music is cheerful, from the number of white houses scattered up and down in the neighbourhood. It is regularly built, has some good public edifices, and has a neatness Superior to most towns in Ireland. The castle is a fine ruin overlooking the Barrow. The Roman Catholics have a large factory here. Carlow is 39 Irish miles S.E. of Dublin, on the great southern road, in N. Lat. 52° 52' W. long. 7° 56'. Dr. Beaufort's Book of Roads, &c.

Carlow, a military town of Selva, in which the Greek bishop of Selvania resides; founded by the princes who concluded there with the Turks in 1699, and also for its sacred wine.

Carlsbad, a town of Bohemia, in the circle of Sanz, on the river Eger, celebrated for its baths of hot water, discovered in 1757 by the emperor Charles IV., as he was hunting; 56 miles W. of Prague.

Carlsbad, or Caroline Water. These very singular and celebrated hot mineral waters I have engaged (as they deserved) the attention of many naturalists and chemists. They are situated at the town of Carlsbad, in Bohemia, on the banks of the river Toepich, or Teply, which joins the Eger, a tributary to the Elbe, and were first brought into high repute by the emperor Charles IV. about the year 1757.

There are several springs of this water within a small compass, of which the principal one, called the Parol, or Forus, oozes out with great vehemence in a large body through a natural vault or incrustation of flataclite, which it has formed by long deposition.

The temperature of this fountain is invariably 165° Fahr. at all seasons, and hence it always lends forth a considerable body of steam. Some of the other springs are only 120° to 125°. The taste of this water is strongly alkaline, saline, rather bitter, and strongly chalybeate. It has scarcely any smell, and contains nothing hallucinogenic.

This water is remarkable for a very rapid deposition of carbonat of lime as it cools, which forms a very hard and beautiful flataclite, or petrifaction, that encrusts any wood, mofs, &c. which happens to remain in it for a day, and soon chokes up any pipe through which it is conducted. Along with the carbonat of lime, the iron which it holds is also precipitated, forming with the former a beautifully variegated flataclite, which takes a high polish.

This water has been analyzed by several eminent chemists, and particularly by Bergman, and by Dr. Becher in his elaborated treatise on this spring, and more lately by Klaproth. The latter only we shall give, which however agrees very nearly with the others.

Carlsbad water contains carbonat of soda, sulphat of soda, muriat of soda, and, when full hot, carbonat of lime held in solution by carbonic acid, fex, carbonat of iron, and a portion of uncombined carbonic acid.

It will not be uninteresting to give in a few words the method by which this excellent chemist proceeded in the analysis of this very compound water.

A given quantity, quite hot from the spring, was first placed in a retort of known capacity, and brought to boil, and the boiling continued till no more air-bubbles were given out. The gas was carefully collected over water, and when examined, was found by the test of lime-water to be pure carbonic acid, excepting the portion of common air of the velfets. This way, however, was not quite so accurate as if a mercurial bath had been employed.

The existence of iron in this water, (as in the Bath waters,) is only ferment to tefts when applied immediately at the spring itself. Under these circumstances, if some of the 

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fresh water is put into a bottle containing a slice of the gall-
nut, a very tenible purple colour is produced immediately.
But on cooling, the minute quantity of iron which it con-
tains separates as a fine flocculent whithish-brown oxide, and
the tell of gall no longer produces any effect.

To discover the actual quantities of the ingredients, 100
cubic inches of the water were gradually evaporated to a
small bulk, during which, an earthy sediment was formed,
which was separated by the filter. This sediment was di-
gested with muriatic acid, which dissolved only a part, and
left a loon slimy earth, which proved to be silex. The mu-
ritic solution was then treated with prussiat of potash, which
caused a blue precipitate of prussiat iron to subside, after
which, the lime that remained in the solution was thrown
down by carbonated alkali. The prussian blue therefore
indicated the quantity of oxyl of iron in the water, and the
carbonated alkali reprecd the carbonat of lime.

It then remained to separate the salts from the clear solu-
tion, being the water lefled to a few ounces by evaporation.
It having been proved by previous tests that the water con-
tained a naked alkali, probably carbonat of soda, and a
salt with sulphuric acid, and another with muriatic acid, the
basis of which was not an earth, but an alkali, there remain-
ed little doubt but that soda was the base in all, (no other
freed alkali being ever found in mineral waters.) The only
object that remained, therefore, was to reprecd the actual
quantity of uncombined carbonat of soda, and the quantity
of the sulphuric and muriatic acids.

Previous experiments having been made on the power of a
given sulphuric acid to satura the soda, some of the same acid
was added to the water till an accurate saturation of the
naked alkali was produced, by which the quantity of the
latter was discovered. The whole was then decomposed by
acetated barytes, and the sulphuric acid of the sulphat of
barytes formed thereby confused therefore of the portion of
acid added to satura the uncombined soda, and of that
which already exisled in the water in the form of sulphat of
soda. By subtracting the former portion from the whole
quantity of acid indicated by the sulphat of barytes pro-
duced, the remainder was the acid belonging to the sulphat
of soda in the water originally, whence the proportion of
this salt could also be estimated. Lastly, the quantity of
muriated soda was found by precipitating the muriatic acid
by nitrated silver.

From these experiments it is concluded, that a hundred
cubic inches of the Carlbad water contain,

<table>
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<tr>
<th></th>
<th>grains</th>
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<tbody>
<tr>
<td>Of dry carbonat of soda,</td>
<td>39</td>
</tr>
<tr>
<td>(equal to 1074 gr. when carbonized.)</td>
<td></td>
</tr>
<tr>
<td>Of dry sulphat of soda,</td>
<td>70</td>
</tr>
<tr>
<td>(equal to 163 gr. carbonized.)</td>
<td></td>
</tr>
<tr>
<td>Of muriat of soda,</td>
<td>34½</td>
</tr>
<tr>
<td>Carbonat of lime,</td>
<td>12</td>
</tr>
<tr>
<td>Silex,</td>
<td>2½</td>
</tr>
<tr>
<td>Oxyl of iron, about</td>
<td>4</td>
</tr>
</tbody>
</table>

Of carbonic acid, 32 cubic inches.
The cubic inch of water here used is equivalent to 290
grains of distilled water.
The average quantity of water daily drank by the visiters
is not less than about five pints, divided in about fourteen
cups. The usual time spent in the use of the water is about
four weeks. The water is used in a great variety of dili-
ders. It is highly serviceable in dyspeptic complaints, ob-
structions of the abdominal visera, diseases of the kidneys,
and urinary passages, and of the utinie system in females.

The actual quantity of saline matter which is conically
poured out with the water, (almost the whole of which is
wasted) is very enormous when the elimate is carried to the
supply of water during a year. Dr. Becker estimates the
main sping alone to throw out hourly 705 emmers, each
either being about half a cubic foot; and hence in the year
it will throw out 5,887,900 cubic feet. These contain
the following quantities of salts, (reduced to pounds avor-
dupsis.)

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Crystallized carbonat of soda,</td>
<td>746,884</td>
</tr>
<tr>
<td>Sulphat of soda,</td>
<td>1,132,923</td>
</tr>
<tr>
<td>Muriat of soda,</td>
<td>238,209</td>
</tr>
</tbody>
</table>

besides earths and iron, and also 59,459 cubic feet of car-
bonic acid gas.

It is estimated also that the water of all the other springs
united, equals that of the great spring, whence the above
numbers may be doubled, and this large quantity has been
annually poured out, for a certainty, during 430 years, to
the year 1800.

No other advantage is made of this spring by way of manu-
ufacture, except that annually some hundred pounds of
sulphat of soda are prepared from it.

CARLSBRUN, in Geographie, a town of Bohemia, in the circle of Chrudim; 6 miles S. of Leutnitzhelm.

CARLSBURG, a village of Germany, in the circle of Franconia, and bisporial of Wurzburg, with a caffle, built by
Charles the Bald, situate on the Maine, oppofite to Carliltad.

CARLSCRONA, or CARLSCROON, a feaport town of Sweden, in the province of South Golithland, which derives
its origin and name from Charles XI. who laid the founda-
tions of a new town in 1680, and removed the fleet from
Stockholm to this place, on account of the advantageous
situation, and fecurity of the harbour. The greater part of
the town stands upon a small rocky island, which rises gently
in a bay of the Baltic; the suburbs extend over another
small rock, and along the mole close to the bafon, where
the fleet is moored. The way into the town from the main
land is carried over a dyke, and along two wooden bridges
joined by a barren rock. The town is luscious, confining of
some houfes of brick, but moily of wood, and one or two hand-
some churches, and containing about 18,000 inhabitants.
The suburbs are fortified towards the land by a stone wall.
The entrance into the harbour, which is naturally difficult,
on account of a number of shoals and rocky islands, is
secured from the attack of an enemy's fleet by strong forts,
built on two islands, under the batteries of which all vessels
must pafs. A dock, planned by Bollem, has been hollowed
in the solid rock; it was begun in 1714, and finished in
1724; but having been found too small, it has been since
enlarged, and is capable of receiving a ship of the first rate.
Its dimensions are 190 Swedish feet in length, 33 in depth,
and 46 in breadth; and it contains 300,000 cubic feet of
water, of which it is usually emptied in 10 hours, by the
labour of 50 men, who are employed at the fame time in
pumping, and relieved every half hour. As this is at prezent
the only receptacle of ships under repair, new docks have
been projected and begun upon a stupendous plan; in the execu-
tion of which it was proposed to construct 30 docks, for
building and laying up the largest ships, at the extremity of
the harbour. A bafon, capable of admitting two men of war,
was designed to communicate, by flues, with two smaller
bacons, from each of which it was proposed to extend five
rows of covered docks; each row being separated by walls
of
of stone, and each dock provided with stone gates, so as to be filled or emptied by means of pumps. Close to the docks, it has been intended to construct magazines for naval stores, and to inclose the whole with a stone wall. This project was begun in 1572, and resumed by Charles III. At the commencement of the works, 25,500l. were annually expended; but the funn has since been lessen'd to about 600l. per annum, and the number of docks reduced to 20. The primary intention of this grand plan was to obtain dry docks, for the purpose of keeping the whole fleet entirely covered from wind and weather. Difficulties have, however, occurred, which have retarded the completion of this work; and in many years they have only finished one dock, the bottom and sides of which are of hewn granite, with rows of granite pillars that support the roof: so that it bears rather the appearance of a colonnade to a temple than a receptacle for ships.

The ships are built at Carlscrona chiefly by English artificers, and as the provinces of Blekinge and Skane, though they abound with oaks, do not furnish enough for a continued supply, the Swedes procure their ship-timber from Germany. From their own territories they are supplied with masts and yards, pitch and tar, and the greater part of the flux used in the navy; the ropes and sails are manufactured from Riga hemp. They call cannon, and make gunpowder with Swedish salt-petre. The harbour of Carlscrona is large and commodious, with depth of water sufficient for ships of the first rate to carry their lower tier of guns. This town is the 15th in order of the towns that vote in the diet. N. lat. 56° 20'. E. long. 15° 26'. 15'. Cox's Travels, vol. iv.

CARLSELD, a mini-town of Germany, in the circle of Erzgebirg, seated on the river Wilzich. It was founded in 1678.

CARLSGRAF CANAL. See Canal.

CARLS-INTEL, Great and Little, or Charles's islands, lie about a Swedish mile from the coast of the island of Gothland; in which was formerly a quarry of marble, used for building the churches of Gothland.

CARLSKAMN, or Carlshaven, lat. 54° 02'. a sea-port of Sweden, in the province of Blekinge, on the Baltic, built in 1658 by Charles X. and improved and fortified by Charles XI. In this town are a woollen manufacture, a forge for copper, and a timber-yard. It has the 15th vote in the diet, contains about 1200 inhabitants, and is distant 22 miles W. from Carlscrona.

CARLSMARCKT, a town of Sielca, in the principality of Brier; seated on the river Stover, and 9 miles E. of Brier.

CARLSRUHE, or Karlsruhe, a town of Germany, in the circle of Swabia and margravate of Baden, situated in a forest, where the prince has a fine palace and gardens. It was founded by the margrave, Charles-William, in 1715, and is constructed on a regular plan. It contains of one principal street, about an English mile in length, which is at a considerable distance in front of the palace, and in a direction parallel with it. All the other streets go off at right angles from this, and are so arranged, that the view in each of them is terminated by the front of the palace. The houses are as uniform as the streets, being all of equal size and height. Here are four churches, two for Roman Catholics and two for Protestants, a synagogue for the Jews, and about 400 houses. The margrave of Baden has contrived every means in his power to introduce industry and manufactures amongst his people. Accordingly there is a considerable number of English tradesmen in this place, employed in manufactures similar to those of Birmingham, and instruct the inhabitants in that line of trade. Here are also many watchmakers from Geneva, whom the prince has engaged to settle in the town by granting them various privileges. Carlshohe is distant 3½ miles N.W. from Durlach, and 14 S. from Philippstede.

CARLSSTADT, a town of Sweden, in the province of Varmeland, built on the island of Tingwalla, formed by the two branches of the Chara-Elb river, which, after encompassing it, unite and fall into the lake Wenner. The island is 12 miles, and the town ¾ mile in circumference. It was built by Charles IX. whose name it bears. The streets are broad and straight; and, excepting the cathedral and school, the houses are constructed of wood painted. It is a bishop's see; and the episcopal palace, which is likewise of wood, but not painted, has a front to extensive, and with so many windows, that it appears like a manufactory. The town contains 1500 inhabitants, who carry on a commerce of iron and wood across the Wenner, and import sugar, tea, and spices. It has a linen and woollen manufacture, and in its vicinity is a medicinal spring. In the order of the diet it has the 38th voice, and is a place of considerable trade. N. lat. 51° 27'. E. long. 13° 15'.

CARLSTAD, a town of Germany, in the circle of Franconia, and bishopric of Wurzburg, on the Main; 12 miles N.W. of Wurzburg.

CARLSBAD. See Marstrand.

CARLUCAT. See Carlus.


Gen. Ch. Cal. fpathe univeral; leaflets four, lanceolate, concave, frayed, spreading, one another, caducous, terminated by four or five points; fpathe common cubical, four-flowered; fpathe proper oval, crowned with numerous round teeth. Car. none. Stam. in the male flowers numerous, very short, inserted into the receptacle. Pfl. in the female flowers; germ cubical, hollowed at the top into two furrows crossing each other; styles four, filiform, very long; stigma resembing an anther. Peric. berry cubical, one-celled. Seeds numerous, small, oblong, even. The male and female flowers are intermingled on the same frpaxid.

CARLUX, or Carlux, in Geography, a town of France, in the department of the Dorodogne, and chief place of a canton in the district of Sarlat; 6 miles E. of Sarlat. The place contains 619, and the canton 5863; inhabitants: the territory comprehends 122½ kilometres and 15 communes.

CARMACE, in Ancient Geography, a people of European Sarmaca, placed by Piny in the vicinity of the Palus Nacot.

CARMAGNOLE, in Geography, a fortified town of Piedmont, in the marquisate of Saluzzo, which formerly gave the title of count to the eldest son of the marquis. The name is a diminutive of Carmagna, which was a town in its neighbourhood, that funk in size and importance, whilst the latter, by an ascension of its inhabitants, increased. In the war between the French and Imperialists, 1691, it was fortified by the former, and made one of the strongest places on the frontiers of Piedmont. The four faubourgs built by the French at some distance from the town are well peopled, and divided into four parishes. Within the walls Carmagnola has only one parish; and the whole number of inhabitants in the faubourgs and the town is estimated at 6700. The market is well supplied, and much frequented by perfoms from the adjacent countries, as well as by the Piedmontese themselves. It is 11 miles S.S.E. of Turin, and 13 N.N.E. of Saluzzo. N. lat. 44° 42'. E. long. 7° 34'.

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CARMANICUS SINUS, or Gulf of Carmania, the name given by Ptolemy to the Persian Gulf: the sea which washed the coasts of Carmania was called Carmanianus Pelagus; and the ancient name of mount Pangæus was, according to Plutarch, Carmanianus Mons.

CARMANOR, a name which, according to Plutarch, (De Floro.) was given to the river Iincus; and mount Taurus was, as he says, denominated Carmanianum monte, from Carmanor, the son of Bacchus, who lived there and his life in hunting.

CARMARA, a town of India, placed by Ptolemy on this side of the Ganges.

CARMATHIANS, or KARMATIANS, in History, an Arabian sect, which bore an inveterate malice against the Mahometsans, and which began to occasion disturbances in the year of the Hegira 277, A. D. 890. It is said to have derived its origin from an Arabian preacher of the name of Carmath, in the neighbourhood of Cufa, who assumed the lofty and incomprehensible style of the guide, the director, the demonstration, the word, the holy ghoold, the camel, the herald of the Messiah, who had converted him in a human shape, and the representative of Mohammed, the son of Ali, of St. John the Baptist, and of the Angel Gabriel. In his mystic volume, the precepts of the Koran were refined to a more spiritual lense; he relaxed the duties of ablation, fasting, and pilgrimage; allowed the indiscriminate use of wine and forbidden food; and nourished the fervour of his disciples by the daily repetition of 50 prayers. The idlenesses and ferment of the riotous crowd awakened the attention of the magistrates of Cufa: a timid prosecution affihied the progress of the new sect; and the name of the prophet became more revered after his person had been withdrawn from the world. Carmath, or Karmata, contrived by his fanatism to form a very large party of followers, out of whom he chose 12, as his apostles, to govern the sect, and to propagate his doctrines. The governor of the province feigned the prophet, and committing him to prison, swore that he should die; but a damsel belonging to the governor, overhearing this menace, took the key of the dungeon from under her master’s head as he slept, and having released the prisoner, returned it to the place from which she had taken it. His adherents took this occasion of reporting, that God had taken the prophet, who had made his escape into heaven. He appeared afterwards in another province, and declared to his followers, that it was not in the power of any one to do him hurt; notwithstanding which, his courage failing him, he retired into Syria, and was not heard of any more. His sect, however, continued and increased; and his 12 apostles divided themselves among the Bedoucens, “a race of men,” says Abulfeda, “equally devoid of reason and of religion,” and by the success of their preaching, they threatened Arabia with a new revolution. The Carmathianas were ripe for rebellion, since they disclaimed the title of the house of Abbas, and abhorred the worldly pomp of the caliphs of Bagdad. They were insusceptible of discipline, since they vowed a blind and absolute submission to their Iman, who was called, in their apprehension, to the prophetic office by the voice of God and the people. Instead of the legal tithes, he claimed the fifth of their subsistence and spoil; the most flagitious crimes were no more than the type of disobedience; and the brethren were united and connected by an oath of fealty. After a bloody conflict, it prevailed in the province of Bahrein, along the Persian Gulf; the tribes of the desert were subject to the shepheard, or rather to the sword, of Abu Said and his son Abu Taher; and these rebellious Imans could muster in the field 107,000 fanatics. The mercenaries of the caliph were dispersed in every action; the cities of Recess and Baldae, of

Cufa
Carmel is not only the name of the mountain, but of a city which is said to have been built upon it, and of a heathen deity worshipped in it, without either temple or altar, as Tacitus tells us (Hist. 4, 20). It is supposed, however, that these have been of some temple upon it, since Jamaihah (in Vit. Ptolemy) forms us, that this place was the favourite retreat of Hyphasis, who spent much time alone in the temple. According to the Greeks, called it 'Oepeis oxi hour, the mountain and temple of Jupiter. Sometimes says, that Vishnupat ascended this mountain, and offered a sacrifice to the deity of the place, when he came into Syria in order to seduce the Jews who had revolted. This mountain has been celebrated and revered among Christians, on account of its having been the residence of Elijah, who is supposed to have lived in a cave, which is there shown, before he was taken up into heaven; and in the summit of it is a chapel dedicated to this prophet, which affords an extensive prospect over the sea and land. This is also said to have been the scene, where Elijah called for a fire from heaven, which consumed the divine sacrifice, thus convincing the Israelites of their folly in hating between their God and Baal. (1 Kings, xix.)

On this account the Christians began, from the earliest ages, to manifect a more than ordinary veneration for it; and both the mountain and cave of Elijah, as well as the place where they say his garden was, are visited and revered not only by Christians and Jews, but also by the Mahometans. We are likewise told, that a church with a monastery was erected on this mountain in some of the early ages of Christianity, and that when, by the lapse of time and the fury of its enemies, it was decayed and almost destroyed, a new one was afterwards erected by the zeal of a Calabrian priest, who founded the order of the Carmelites, since spread through all the Roman Catholic countries, and of whom there is still a certain number, living in this ancient monastery. See Carmelites.

Carmel was also a city of Palestine in the southern part of the tribe of Judah, seated on a mountain of the same name, which was part of a long chain of mountains, that pafled through the southern part of Palestine and over the lower coast of the Asphalite lake, and bounded the country of the Amalekites. This city was the residence of Nabai the carmelite, Abigail's husband; and it was on this mountain that Saul returning from his expedition against Amalek, erected a trophy. (1 Sam. xvi. 11.)

Carmel, Knights of Mount, are a military order of knights Hospitallers, instituted in 1607, by Henry IV. of France, under the title, habit, and rule of our Lady of Mount Carmel, and in confederation of a bull of pope Paul V. in 1608, united to the order of St. Lazarus at Jerusalem, with all its commanderies, priories, and other goods for its endowment. The founder proposed it to consist of one hundred French gentlemen, who should be obliged, in times of war, to march close to the kings of France, as their guard. Authors are much divided, whether to call this a new institution, or a reformation of that of St. Lazarus; though it is generally accounted a new institution. See Lazurus.

Carmel, in Geography, a township of America, in Dutchess county, New York. By the last census of 1790, 237 of its inhabitants were electors. See Lazurus.

Carmel, in Geography, a river of Scotland, which runs into the Irvine, in Renfrewshire.
CARMELITE WATER. See Carmes, Eau de.

CARMELITES, or White Franciscans, or the order of our Lady of Mount Carmel, an order of religious, making one of the four tribes of mendicants, or begging friars; and taking both the name and origin from mount Carmel, (above described,) formerly inhabited by the prophets Elijah and Elilah, and by the children of the prophets; from which this order pretend to descend in an uninterrupted succession.

The manner in which they make out their antiquity has something in it too ridiculous to be rehearsed. Some among them pretend they are descendants of J. C. who, as well as the virgin Mary, are said to have assumed the habit and profession of Carmelites. Others go farther, and make Pythagoras a Carmelite, and the ancient Druids regular branches of their order. The learned Jesuit, Papebroch, was accused before the tribunal of the Roman pontiff, by the Carmelites, on account of his having called in question the dignity and high antiquity of their order. The conject on this subject was long and tedious; but it was so far determined, or at least suspendered, in the year 1665, by Innocent XII., that silence was imposed upon the contending parties: although the Carmelites affirm to this very day, that the prophet Elijah was the parent and founder of their ancient community.

Phocas, a Greek monk, speaks the most reasonably; he says, that in his time, viz. in 1185, Elijah’s cave was full extant on the mountains, near which were the remains of a building, which intimated there had been anciently a monastery; that some years before, an old monk, a priory of Calabria, whose name was Berthold, by revelation, as he pretended, from the prophet Elijah, fixed there, and assembled ten brethren. In 1250, Albert, patriarch of Jerusalem, gave the found a rigid rule; which Papebroch has first printed. This rule consisted of 16 articles; one of which confined them to their cells, and enjoined them to continue day and night in prayer; another prohibited the brethren having any property; another enjoined falling from the feast of the holy cross till Easter, except on Sundays; abstinence at all times from flesh was enjoined by another article; one obliged them to manual labour; and another imposed upon them a strict silence from vespers till the tierce the next day. In 1257, or according to others, 1226, pope Honorius III. approved and confirmed this rule; though it was afterwards mitigated by Innocent IV. On the conclusion of the peace between the emperor Frederic II. and the Saracens in 1229, the Carmelites quitted the Holy Land, under Alan the fifth general of the order. Some of them were sent to Cyprus, in 1238, and founded a monastery in the forest of Fontania. Some Sicilians at the same time returned to their own country, and founded a monastery in the suburbs of Meffina. St. Louis brought some of these Carmelites with him from the Holy Land into France. Many of the popes gave them the title of “Brothers of the Blessed Virgin.”

The Carmelites came into England in the year 1240, and erected a great number of monasteries. Their first houses were at Alnwick in Northumberland, and Allesford in Kent. In England and Wales they had about forty houses. This order is eminent for the devotion of the feaculary, for its missions, and for the great number of saints with which it has stocked the Romish church. In the 17th century, there were four canonizations in this order, viz. of S. Theresa, S. Andrew Corin, S. Mag. de Pazzi, and S. J. de la Croix.

In the 16th century S. Theresa, a Spanish lady of an illustrious family, undertook the difficult task of reforming the Carmelite order, which had departed much from its primitive sanctity, and of reftoring its neglected and violated laws to their original credit and authority. Her associate

in this arduous attempt was Johannes de Santa Cruza, and her enterprise was not wholly delineate of success, notwithstanding the opposition she met with from the greatest part of the Carmelites. Hence the order was, during the space of 15 years, divided into two branches; of which one followed a milder rule of discipline, while the other embraced an inftinate of the most severe and self-denying kind. The former, viz. Carmelites of the ancient observance, were called the mitigated, or moderate; and the latter, or those of the strict observance, were called Barefooted Carmelites.

The ancient observance has only one general, under whom are forty provinces; and the congregation of Montana, which has a vicar-general.

Barefooted Carmelites are a reform of the ancient Carmelites, set on foot in 1540, by St. Theresa; so called from their going bare-footed.

She began with the convents of nuns, whom she restored to the primitive austerity of the order, which had been mitigated by Innocent IV. in 1245, and at length carried the same reform among the friars. Pius V. approved the design, and Gregory XIII. confirmed the reform in 1558; at the particular desire of Philip II., king of Spain. This separation of the bare-footed Carmelites from those of the ancient observance was confirmed, in 1587, by Sixtus V., and completed, in 1609, by Clement VIII., who allowed the former to have their own chief, or general. But, after having withdrawn themselves from the others, these austere friars quarrelled among themselves, and in a few years their differentions arrived at such a height, that they were divided anew, by the pontiff last mentioned, into two communities, each of which was governed by its respective general, and had its peculiar constitutions: the one the congregation of Spain, divided into six provinces; the other called the congregation of Italy, comprehending all the rest, not depending on Spain.

The habit of the Carmelites was at first white, and the cloak laced at the bottom with several folds. But pope Honorius IV. ordered it to be changed for that of the Minims. Their scapulary is a small woolen habit of a brown colour, thrown over their shoulders. Instead of linen shirts, they wear lnsey-wolsey, which they change twice a week in the summer, and once a week in the winter.

CARMELO, in Geography, a river on the coast of New Albion, S.E. of Francisco bay. N. lat. 36° 5'.

CARMELUM PROMONTORIUM, in Ancient Geography, a maritime point of mount Carmel near Caipha. See ACRE.

CARMELUS, in Mythology, a deity of the Syrians, who inhabited the vicinity of mount Carmel. He had an altar, but no temple. Tacitus (Hist. II. 78.) says, that a priest of this deity predicted to Vespasian, that he should be emperor.

CARMEN, an ancient term among the Latins, used, in a general sense, to signify a verse; but in a more peculiar sense to signify a psalm, charm, form of exortion, exclamation, &c. couched in a few words, placed in a mystic order, on which its efficacy depended.

Scuton derives Carmen from the Celtic cermn, the front of joy, or the verses which the ancient bards sung, to encourage the soldiers before the combat; adding, that the Greek κερκος signifies combat and joy; which is true; but then it does not come from the Celtic cermn, but from κερκος, I rejoice.

Some fetch the origin of the poetical carmina, or verses, hence: and say, they took that name from their resemblance to tse spells; others, on the contrary, say, that the spells had their origin from the poetical verses, and took their name from their resemblance to those; it is at least certain,
certain, that many of the ancient chansers, wherewith dieses were supposed to be cursed, were metrical verses, to which, in these ages, greater efficacy was ascribed than to mere words or profe.

Vigenerce, again, derives carmen from Carmenata, because that prophets couched their predictions in verses, or choral prologues; but others say, the prophets took the name Carmen from carmen, on the latter account.

CARMEN, was anciently a denomination given to preceptors, laws, prayers, imprecations, and all solemn formulas, couched in a few words, placed in a certain order, though written in prose.

In which sense it was, that the elder Cato wrote a "Carmen de moribus," which was not in verse, but prose.

CARMEN falubre, a sect of ancient verses composed by Numua, sung by the salii, accompanied by the clashing of Ancylos or sacred bucklers. See Ancylo.

Carmen also denotes a form of prayer, or words whereby divers among the ancients devoted themselves. Such was that of the Decii, spoken of by Pliny, Hist. Nat. lib. xxxviii., cap. 2.

CARMEN, or Carmina, in Geography, an island near the west coast of Norway, about 14 miles long and two broad. N. lat. 59° 30'. E. long. 5° 29'.

CARMENIAN WOOL, a denomination given to a kind of goat's hair, brought from Carmenia, or Carmania, a country of Asia Minor. See Carmelia.

CARMELTALIA, a feud, among the old Romans, celebrated annually on the 11th of January, in honour of Carmona, or Carmentis, a prophetess of Arcadia, mother of Evander, with whom she came into Italy, 60 years before the Trojan war. After her death she was admitted into the number of the Divi indigetes of Rome. Dionysius Hal. and Plutarch say, that Carmenata was the "Themis" of the Greeks. The solemnity was also repeated on the 15th of January, which is marked in the old calendar by Carmelitalia relata. This feast was established on occasion of a great fertility among the Roman dames, after a general reconciliation with their husbands, with whom they had been at variance, in regard of the use of coaches being prohibited them by an edict of the senate.

The women celebrated this feast: he who offered the sacrifices was called Scaccobis Carmentalis.

Authors are divided about the origin of the word Carmen: Vigenerc says, the prophetess was so called quia carmis verba, out of her frenzy; by reason of the enthusiasm the frequently fell into. Others say, she took her name from carmen, verse; because her prophecies were couched in verses; but Vigenerc, as before noted, maintains carmen to be derived from Carmenata.

CARMELTALIS PORTA, in Ancient Geography, a gate of Rome, situated on the banks of the Tiber, at the foot of the Capitol, in the place called "Montanara." It was also called Scelerina, because the 300 Fabians, defeated by the Etruscans, on the banks of the Crmara, made their escape from Rome through this gate.

CARMES, EAU DE, the Carmelite water, or compound balm water, famous in France, and most parts of Europe for its extraordinary cooling virtues. It is said to be extremely reviving, to be good in all sorts of fits, apoplexies not excepted; and to relieve the gout when it attacks the Roman. The Carmelites at Paris, who make considerable advantage by vending this water, keep the preparation of it a great secret. See Melissa.

CARMINATIVE, in Materia Medica, a denomination formerly applied to those articles of the Materia Medica, which poifefs the property of distilling wind from the bowels.

The origin of this absurd term has been ascribed to those times of ignorance and superstition. In the practice of medicine, in the hands of licential and ignorant men, was intimately connected with magic, predictors, and other rites of deception: among which, incantations in verse (carmas), recited during or preceding to the administration of the remedies, were frequently related to. In several cases, disorders, especially in the form of hysterical complaints, and in some of the forms of stomatitis, or inflammation, the operation of medicines of this class is extremely quick; their effects are obvious and unequivocal, and the relief which they afford is extremely considerable: hence they were peculiarly adapted for the accomplishment of incantations. It is not improbable, however, that the term may have been originally adopted in a metaphorical sense. A medicine operating thus quickly, and producing almost instantaneous relief, might be said to operate like a charm; and it might therefore be figuratively, but quaintly denominated carminative. The word is scarcely to be found in the medical language of the present day.

The substances included under this denomination, are of an aromatic or gracefully delicious nature; consisting chiefly of the essential oils of vegetables, either pure, or suspended in water by distillation, or combined with volatile salts or other stimulants; of the left active forms of the ethers, or the dulcific spirits, as they were formerly called, &c. The stomach when greatly dilated with wind, becomes unable to relieve itself (like the bladder, after a long retention of the urine), partly in consequence of the weakened state of the over-tretched fibres of its muscular coat, and partly, perhaps, from a contraction of the cardia, or upper orifice. For, however difficult it may be to explain it, the fact is well known, that a loss of power to act, and a morbidly increased or spasmodic action, are both consequences of the debility of the muscular fibre. The mode of operation of the carminative medicines, therefore, on the contractile coats of the stomach, by which it is relieved from the distention of wind, consists chiefly in exciting to a certain degree of action the dilated and weakened muscular coat, by which the accumulations are propelled, though the upper orifice; but partly also in revolving any flight spasmodic contraction of that orifice, which may exist. For as debility produces, so stimulants counteract, both the diminished and the morbidly great action of the muscular structure.

CARMINUM is a beautiful red precipitate of the colouring matter of Cochinilla, which see.

CARMINIUM, in Ancient Geography, Carmignana, a place of Italy, near Aletium, over against Lupia, and before Tarentum, in Messapia.

CARMONA, in Geography, a town of Spain, in the province of Andalufia; it was known to the ancients by the name of Carmo, placed in Bética, to the south of Ibera, and south-east of Hilipolis, and esteemed by Caesar one of the strongest towns of the country. Philip IV. in consideration of a present of 40,000 ducats, gave it the title of city. It is built on a declivity, looking down upon a rich valley, which is bounded by distant hills, excepting only to the south, where a wide opening gives a pannage to the Guadalquivir. It contains 12,685 persons, and includes 7 parish churches, with 5 conven for men, 2 for women, and 2 hospitals; and they reckon in this place more than 100 oil mills: about 20 miles N.E. from Seville, and 40 S.W. from Cordova. N. lat. 37° 14'. W. long. 5° 37'.
belonging to the house of Aulonia. N. lat. 46° 15'. E. long. 5° 37'.


Chats and order, pennantaria digynia.

Gen. Ch. C.d. permanent, with five acute segments. Coret. monoptepalous: tube short; border with five acute divisions. Stem. five. Pflr. germ superior, globose; styles two: stigmata simple. Peric. drupe globose; but with five cells and five seeds.


According to Ventenat, it is nearly allied to Ehretia.

Carmoyle Road, in Geography, an anchorage in Belfast loch, on the north-eastern coast of Ireland, where large vessels, which load or unload at that port, usually lie.

Carmulita, a town of Hindoostan, in the fomofah of Dowhatabad; 70 miles N. from Vizapour, and 88 E. from Poonah. N. lat. 18° 40'. E. long. 75° 22'.

Carmyllissus, in Ancient Geography, a town of Asia Minor, in Lycia, situated in a small valley, at the foot of mount Antaracus; mentioned by Strabo.


Carna, in Geography, a town of Arabia Felix, according to Ptolemy and Strabo, the latter of whom says, that it was the largest town belonging to the Minocas, a people who inhabited the coast of the Red Sea, and who were neighbours to the Sabaeans.—Also, a town of Phenicia, the "Carnes" of Pliny.

Carnabadium, in the Materia Medica of the ancients, a name given to a drug frequently mentioned by the Greek and Arabian writers.

Carnabat, in Geography, a town of European Turkey, in the province of Romania; 50 miles W. of Burgas.

Carnaborus, a town of Poland, in the palatinat of Red Russia; 63 miles S. of Halicz.

Carnac, or Karrac, a village of Egypt, about 1½ mile below Luxor (which see), consisting of miserable cottages, which serve as a foil to the magnificence of the splendid ruins by which they are surrounded. These comprehend obelisks, some of which are very beautiful and well preserved, rows of sphinxes, and a number of terraces, composed of basaltic with a dog or lion's head, of Egyptian sculpture, which formed to serve as avenues to some principal building; mutilated statues; walls covered with historical engraving; which is a representation of men, horses, chariots, and battles; portions of great elevation; colonnades of immense size; and columns of astounding brilliancy; granite and marble; and towns of prodigious dimensions, supported by capitals, and forming the roof of magnificent buildings, &e. &c. Bruce fugites, that Luxor is Di. ipolis, and that Carnac, together with that place, constituted the "Jovis Civitas magna" of Ptolemy.

Carne, or Carnac, in Ancient Geography, a people placed by Pliny in the European Sarmatia, near the Cimmerian Bosporus.

Carnal Manasal, in Geography, a town of Arabia; 45 miles S.E. of Mecca.

Carnalis, in Ancient Geography, a town of Asia Minor, placed by Ptolemy in Armenia Minor.

Carnaloch, or Carn Lough, in Geography, lies in the country of Arran, Ireland, near the mouth of the small river Gleavey, which falls into Glenarm bay; 2 miles N. of Glenarm, and 108 N. of Dublin.

Carmanart, a river of the country of Galway, Ireland, which falls into the bay of Galway; it has several branches, one of which proceeds from Loughrea. This river is partly subterraneous, and it forms a turlogh; i.e. a spot which in winter appears as a lake, but in summer is dried up, and reclaimed a good deep-walk.

Carnapole, a factory on the Malabar coast of India, S.S.E. from Cochin.

Carnarium, a channel-house, or repository for the bones of the dead.

Carnasa, or Carsana, in Ancient Geography, a town of India, on this side of the Ganges. Ptolemy.

Carnatic, or Carnada, in Geography, a country of Hindoosan, lying along the coast of Coromandel, from Cape Comorin, in N. lat. about 8° to about 16°. It is bounded on the north by the country of Golecanda, on the east by the bay of Bengal, and on the west by the Myfore, Dindigul, and Travencore. The dominions of the late Mahomed Ally, nabob of the Carnatic, and an ally of the East India company, commence on the south of the Guntow Ciree, called also Mortizanaugar and Condavir, and extend along the whole coast of Coromandel to cape Comorin; including Tanjore, Marawar, Titchinopoly, Madura, and Ténivelly, all being appendages of the Carnatic. Under this description, the Carnatic is not less than 570 British miles in length from north to south, but no where more than 120 wide, and commonly no more than 75. "Such a long narrow tract of country," says major Kennell, "bordered by an active and powerful enemy, whose territories are, moreover, of a compact form, and his force more readily collected, must always be subject to have its distant provinces cut off from its affluence; or, if it divides its force, for their separate defence, the safety of the whole will be endangered." The Carnatic, says this ingenious geographer, anciently comprised all that part of the peninsula that lies south of the Goudegama and Toombuddra rivers, from the coast of Coromandel eastward to the Gout mountains westward, and divided into Bollagaut (which see), and Payengaut; the former being the western part, and the latter the eastern part, or the Carnatic, according to its present definition. The revenue of the nabob is fixed at about a million and a half sterling per annum; out of which he was accustomed to pay a subsidy of 160,000l. per annum, to the East India company, towards the expense of their military establishment. The evils attendant on the improvident conduct of the nabob have been frequently felt in past times, and measures have been adopted for guarding against them in future. This nabob has been one of the most ancient, and was supposed to be one of the most faithful, allies of the British nation in India: and Mahomed Ally is said to have been established in the government of Arcot (the capital of the Carnatic), and its dependencies, chiefly by the active cooperation of the British power in India. During the war, in 1780, a combination was formed against the Carnatic, between the French and the famous Hyder Ally, and his successor Tippoo Sultan; and they had made some progress towards the conquest of it, till they were stopped by the interposition of Great Britain. In consequence of this event, it became necessary that an adequate military establishment should be maintained by Great Britain for the defence of that country; and, in 1787, a regular contract was settled to that effect; the nabob Mahom d' Ally agreeing to pay an annual subsidy for the support of the troops, amounting to 15 lacs of pagodas. After the war, in
1793, between Great Britain and the late Tipoo Sultan, it was represented to the marquis Cornwallis, that the nabob was unable to discharge these pecuniary engagements, and an indulgent modification of that treaty was framed, which reduced the subsidy to nine lacs of pagodas. In both treaties, however, it was stipulated, that the nabob should contract no alliances, nor cut off correspondence with any European or other power, without the knowledge and concurrence of the British government. Upon the death of Mahomed Ally, in 1793, he was succeeded by his eldest son Omutul Omrah. The second son of the nabob, viz. Azam ul Omrah, whose fate is unknown to us, left behind him a son Azeen ul Dowlah, who was kept a prisoner in the palace of the nabob at Chepauk, till the death of his uncle, the late nabob. The nabob Omutul Omrah professed that he succeeded to the possession of the territories of his father under all the obligations of the treaties of 1787 and 1792, and a reciprocal friendship subsisted, for some time, between him and the English company. Nevertheless, after the fall of Seringapatam, in 1799, the original records of Tipoo Sultan, as well as his official correspondence, fell into the hands of the British government; and it was discovered, that the nabobs Mahomed Ally and his successor, Omutul Omrah, had carried on with Tipoo Sultan a correspondence, inconsistent with, and tending to the subversion of, the alliance between the nabob of the Carnatic and the India company, and incompatible with the security of the British power in the peninsula of India. Hence it was concluded, that these princes had placed themselves in the situation of enemies to Great Britain. As the nabob approached his end, instructions, dated the 7th and 9th of July, 1801, were issued by the government of the East India company, and a party of troops was stationed at the palace of Chepauk, for the purpose of carrying them into effect. On the death of the nabob, an attempt was made to adjust the affairs of the Carnatic, under the direction of Lord Clive, governor of Madras. In the mean while Omutul Omrah, the nabob, died; and the British agents were informed, that he had appointed his reputed son, Tajeel Omrah, commonly called Ally Husseain, then about the age of 18, to be his heir. In the course of the negotiation that ensued, it was alleged, on the part of the British agents, that the only adequate security for the rights and interests of the British government in the Carnatic was the entire and exclusive administration of the civil and military authority. To this proposition it was objected, that if this was to be the basis of the arrangement, the flotation of nabob of the Carnatic must be annihilated, and all the power transferred into the hands of the company. On the other hand, it was replied, that the condition now proposed actually exiled in the treaties of 1787 and 1792; and that the object of the proposed arrangement was to secure the rank, dignity, and splendour of the nabobs of the Carnatic, instead of exercising the full rights acquired by the British government. Ally Husseain, with the advice of his two khans, expressed his disapprobation of the terms proposed; and when the treaty with him was brought to this termination, it was resolved, if possible, to open a negotiation with the prince Azzeen ul Dowlah; the consequence of which was, that the prince affixed his signature to a Persian draft of the proposed treaty, on the basis of that rejected by Ally Husseain, binding himself to execute a more formal treaty, at the period of his intended installation; and on the following day he was formally introduced to the governor of Madras, as the future nabob of the Carnatic, and conducted to the palace appointed for his residence. Thus the whole substantial power of the Carnatic was vested in the hands of the India company, and a proclamation was issued expelling the nature and terms of the arrangement. The treaty bears date the gift of July, 1801, and enjoins that a permanent system for the collection of the revenue, and for the administration of civil and criminal justice, under the sole and undivided authority of the favourable company, exercized by the governor in council of Fort George, shall be established throughout every soil and province, of the entire dominions of the Carnatic.

The British possessions in the Carnatic are confined, chiefly, to the tract called the "Jagir," which extends along the coast, about 188 British miles, and 17 inland, in the widest part. Its revenue is reckoned at 7,500,000. Before the Jaghire, there are lands dependent on Cuddalore; but the amount is not considerable. The whole amount of the land revenue dependent on Madras, including the cizairs, is flated at 7,500,000. per annum. The principal towns of the Carnatic are Arcot, the capital, Madras, Ongole, Pondicherry, Cuddalore, Tanjore, Trichinopoly, Madura, and Tennevelly. The principal rivers are the Pernar, the Palifer, and the Cuvrey. The Carnatic abounds with forts and fortresses of various kinds. Carnatic-gur and Doby-gur are two noted fortresses on the ridge of hills on the west of Arcot.

CARNATION, in Botany. See Dianthus Caryophyllus.

CARNATION, Spanish. See Calliafa Vescenria.

Carnation-grafs, in Agriculture, a term applied to the finer sorts of grapes, probably from their having this kind of colour in their flowers.

Carnation-tree. See Calliafa Ilenia.

Carnation, among Dyers, red rose-colour, for which take liquor of wheat-bran a sufficient quantity, alum three pounds, tartar two ounces; boil them, and enter twenty yards of broad cloth; after it has boiled three hours, cool and wash it: take fresh clear bran-liquor a sufficient quantity, and madder five pounds; boil and adder according to art.

The Bow-dyers know that the solution of Jupiter, or delved tin, being put in a kettle to the alum and tartar, in another procees, makes the cloth, \\
&c. attract the colour into it, so that none of the cochineal is left, but the whole is absorbed by the cloth.

Carnation, Flehs-colour, in Painting, is underfoot of all the parts of a picture in general, which represent flehs; or those parts of the human figure which are naked, and without drapery.

Titian and Corregio, in Italy, and Rubens and Van-Dyke in Flanders, excelled in carnations.

It may be here observed, that the word carnation is not properly used for any particular part of the person painted, but for the whole nudity of the piece. See Colouring.

CARNATUS, in Ancient Geography, a river of Asia Minor, in Catanippia.

Carnawall, in Geography, a town of Hindooistan, is the country of Sirhind; 7 miles N.W. of Delhi.

Carnchunaig, a mountain of Scotland, near Kincardine, in the county of Rofs.

Carnk, in Ancient Geography, a town of Asia, situated on the confines of Phcenicia and Syria, placed by Steph. Byz. in the former, and by Pliny in the latter. Strabo calls it Caranos, and makes it a sea port of the Arabians.—Also a town of Asia Minor, in the Ecide. Steph. Byz.

Carnk, in Geography, a small part in the country of Donegal, province of Ulter, Ireland, in the northern part.
part of the peninsula of Inisowen; 133 Irish miles N.W. from Dublin, and about 18 N.W. from Londonderry. N. lat. 54° 14'. W. long. 5° 59'.

Car, a fishing town, or rather village in the peninsula of the Mullet, county of Mayo, Ireland, not far from the island that joins it to the other part of the county. See Mullet. N. lat. 54° 14'. W. long. 96° 50'.

Carnea, in Ancient Geography, a place of Palelinne in Batacena, north-east of mount Galaad, and south-east of Tiberias.

Carneades, in Biography, an eminent Greek philosopher, the founder as well as an illustrious ornament of the third or new academy, was a native of Cyrene in Africa, and born, according to the most probable supposition, in the 3d year of the 141 Olympiad, B.C. 214. He received his first instructions with regard to the art of reasoning from Diogenes the Icne, and when he became a member of the academy, he attended the lectures of Egefinus, and from him acquired the art of disputation which had been introduced by Arcesilaus. As the successor of Egefinus in the chair of the academy, he contributed to restore its declining reputation. Having occasion to visit Rome, in company with Diogenes the Icne and Critolaus the peripatetic, on an embassy for obtaining the mitigation of a fine inflicted upon the Athenians, by the Sicilians under the authority of the Romans, for having lated Welle Oropus, a town of Batavia, Carneades and his associates exhibited many specimens of Grecian learning and eloquence, not before known in that city. Carneades excelled in the vehemence and rapid, Critolaus in the correct and elegant, and Diogenes in the simple and modest kind of eloquence. The former having one day harangued, with great variety of thought and copiousness of diction, in praise of justice, before Galba and Cato the censor, undertook next day, with a view of establishing his doctrine of the uncertainty of human knowledge, to refute all his former arguments. He attracted the attention and excited the admiration of his auditors by the subtlety of his reasoning, and the fluency of his language; and the popularity which he acquired alarmed Cato to such a degree that he persuaded the senate to hale the return of these philosophers to their own schools, left the Roman youth should lose their military character in pursuit of Grecian learning. In his own school the reputation of Carneades, both as an orator and a philosopher, was so great, that other philosophers, when they had dismissed their scholars, came to hear him. So intent and indefatigable was his application to study, that at his meals he often forgot to take the food that was set before him. Whilst he did justice to the merit of Chryfippus the Icne, he frequently opposed him; and he used to say, that if there were no Chryfippus, there would be no Carneades, thus acknowledging he owed a considerable degree of his reputation as a disputer to the abilities of his opponent. He possessed extraordinary powers of voice, and was accustomed to speak so loud, that he needed some standard by which to regulate it; but his master told him that he had such a measure or standard in the number of his hearers. As he grow old, he was greatly disturbed by the apprehensions of dying, and frequently lamented, that the fame nature which had composed the human frame could difsolve it. After a life prolonged to very advanced age, he clofed it in his 85th, as some fay, or according to Cicero and Varrius Maximus, in his 90th year. For an account of the doctrine of the new academy, as it was epony and taught by Carneades, see Academy. Although he opposed the doctrine of the Stoics concerning the gods, he did it, as Cicero fays, not with a view to destroy the belief of superior powers, but merely to prove, that their theological system was unsatisfactory. A vowing likewise his repugnance to their opinion, concerning fate, he affirmed, on the ground of experience, the existence of a self-determining power in man, and hence inferred, that all things did not happen, as the Stoics maintained, in a necessary series of causes and effects, and consequently, that it is impossible for the gods to predict events dependent on the will of man. As the foundation of morals, he taught, that the ultimate end of life is the enjoyment of those things, towards which we are directed by the principles of nature. Brucker's Hist. Phil. by Enfled, vol. i. Gen. Dict.

Carnedde, in British Antiquity, denote heaps of stone supposed to be Druidical remains, and thrown together on occasion of confirming and commemorating a covenant. Gen. xxxi. 46. They are very common in the isle of Anglesey; and were also used as sepulchral monuments, in the manner of tumuli: for Mr. Rowland found a curious urn in one of these carneddes. Whene it may be inferred that the Britons had the custom of throwing stones on the deceased. From this custom is derived the Welsh proverb, Karr ar dy ben, ill bide thee. Rowland's Mona Antiqua Referred. See Barrow and Beriol.

Carnea, in Antiquity, a festival in honour of Apollo, furname Carnes, held in mott cities of Greece, but especially at Sparta, where it was first instituted in the 26th Olympiad.

The reason of the name, as well as the occasion of the institution, is controverted. It lasted nine days, beginning on the 19th of the month Carneus or Carnius, which fea. The ceremonies were an imitation of the method of living and discipline used in camps.

Carnel. The building of ships first with their timber and beams, and after bringing on their planks, is called carp-worke, to distinguih it from clinch-work.

Vellis also which go with mizen-fails instead of main-fails, are by some called carnels.

Carlenian. See Chalcedony.

Carnera, in Geography, one of the smaller Cape Verd islands, which is little more than a rock.

Carnero, a cape in the South Sea near Santa Maria, on the coast of Peru. S. lat. 1° 35'. W. long. 77° 20'.

Carness, a cape of Scotland, on the north coast of the island of Pomona; 2 miles N. of Kirkwall.

Carnesville, the chief town of Franklin county, in the state of Georgia, America, 100 miles N.W. of Augusta; containing a court-house and about 20 dwelling houses.

Carnew, a small town of the county of Wicklow, Ireland, near the county of Wexford. It makes a despicable appearance, but some lime and much coarse woollen are manufactured in the neighbourhood of it, and its fairs are much frequented. It is 44 miles South from Dublin. N. lat. 53° 43'. W. long. 6° 31'.

Carney, a village in Dorset, wherein their mouths become so furred that they cannot eat.

Carni, in Ancient Geography, a people who were separated from Norica by the Carnic or Julian Alps. According to Ptolemy they had three cities, "Forum Julium," "Concordia," and "Aquileia." Hence it appears that they occupied a part of the state of Venice. Orosius says that they were a Gaulish nation; and he concurs with the epitome of Livy in saying that they were vanquished in the year of Rome 635, by the confid Quintus Martius Rex.

Carnia, a name given to the territory at the bottom of the Adriatic gulf, inhabited by the Carni. It corresponded to the Venetian Friuli and a small part of Carniola.


Carni-
CARNICOBAR, in Geography, the northernmost island of that cluster in the bay of Bengal, called Nicobar. It is low, of a round figure, about 40 miles in circumference, and at a distance appears as if it were entirely covered with trees; though there are upon it several well cleared and delightful spots. The soil is a black kind of clay, and marly; producing, however, abundantly and with little care, moll of the tropical fruits, such as pine-apples, plantains, papayas, cocao-nuts, and areca-nuts; besides excellent yams, and a root called "cacho." The only quadrupeds upon the island are hogs, dogs, large rats, and a large animal of the lizard kind, called by the natives "tobouma." Of poultry they have only some few hens. The snakes, of various kinds, are numerous, and their bites are frequently fatal to the inhabitants. The timber is plentiful, and of various sorts: some of it is very large, and affords excellent materials for building or repairing ships. The natives are low in stature, but well made and remarkably active and strong; they are copper-coloured, and their features have a cast of the Malay. The women, in particular, are very ugly. The men cut their hair short, and the women have their heads, and wear no covering but a short petticoat, made of a fort of rush or dry grafts, which reaches half-way down the thigh. The men have only narrow strips of cloth tied tight about their middle. The ears of persons of both sexes are pierced when young, and by teasing into the holes large plugs of wood, or hanging heavy weights of shells, they render them wide and dilatable in their appearance. They have enormous appetites, and are addicted to excessive drinking of arrack; and much of their time is spent in feasting, and dancing. Their favourite food is pork, eaten almost raw, and their hogs, fed on the cocoanut and sea-water, are remarkably fat; but they have plenty of small sea-fish, which they strike with their lances. Their common drink is cocoanut milk, and a liquor called "foura," which oozes from the cocoanut tree after cutting off the young sprouts or flowers. This is suffered to ferment, and thus becomes intoxicating. Whilst the old men smoke tobacco, and drink fora, the young sing and dance. Their only musical instrument is a hollow bamboo, about 2½ feet long, and three inches in diameter; along the outside of which is stretched from end to end a single string made of the threads of a spider's web, and the place under the string is hollowed a little, to prevent it from touching. This instrument is played upon in the same manner as a guitar; it produces but few notes, and is generally accompanied with the voice. Their huts are commonly built upon the beach, and form villages, each of which consists of 15 or 20; and each house contains a family of 20 persons and upwards. These habitations are raised upon wooden pillars, about 10 feet from the ground; their form is round, and having no windows, they appear like bee-hives covered with thatch. They enter them below by a trap-door, and with the help of a ladder, which they draw up at night; thus, and also by bending round the pillars a smooth kind of leaf, they secure their huts from being infested with snakes and rats. The flooring is made of thin strips of bamboo, which are laid at such distances as to admit light and air. The art of making cloth is unknown to the inhabitants of this island; but they procure this as well as hatches and hanger-blades, in exchange for their cocoanut, which are reckoned the best in this part of India. They have no money, nor do they allow any value to the coin of other countries, except for the purpose of ornaments; and accordingly the young women sometimes hang feathers of dollars about their necks. The cloth they purchase, beyond that which they want for their own consumption, is intended for the Chonry market.

Chonry is a small island to the south of theirs, to which a large fleet of their boats sails every year about the month of November, to exchange cloth for canons, which they cannot make a home. This voyage is performed by means of the sun and stars; for they have not any knowledge of the compass. In their disposition there are two remarkable qualities: viz. an entire neglect of compliment and ceremony, and an aversion to disturbances. From their frequent intercourse with strangers they have in general acquired the barbarous language of the Portuguese, so common over India; their own tongue has a sound quite different from that of others, their words being pronounced with a kind of drop, or catch in the throat, at every syllable. They have no notion of a God; but they firmly believe in a devil, and worship him from fear. When they are threatened with a storm, they imagine, that the devil intends them a visit, upon which they perform many superstitious ceremonies. When a man dies, his whole live flock, cloth, hatchets, fishing lances, and every movable thing in his possession, are buried with him; and his death is lamented by the whole village. His wife, according to custom, must confer to have a joint cut off from one of her fingers; and if the refues, the must submit to have a deep notch cut in one of the pillars of her house. Polygamy is not known in this island; and they punish adultery, by cutting from the man's offending member a piece of the foreskin, proportioned to the frequency or enormity of the crime. Among these people there seems to subsist a perfect equality. Respect is paid to age, but they have no appearance of the exercise of authority one over another. Their society seems to be cemented by mutual obligations continually conferred and received. N. lat. 9° 17'. E. long. 93° 18'. Asia. Researches, vol. ii.

CARNICULA is used by some for a canuckle, more particularly for that fleshly substancce which invests the teeth.

CARNID, in Natural History, a name given by Averno to what is called carnich by more ancient writers.

CARNIFERES, in Geography, a town of France, in the department of the North, and chief place of a canton, in the district of Cambrai; the place contains 718, and the canton 14,110 inhabitants; the territory comprehends 122½ square kilometres, and 16 communes.

CARNIFEX, among the Romans, the common executioner. By reason of the odiousness of his office, the carnis was expressly prohibited by the laws from having his dwelling house within the city; but lived without the "Porta Metia," or "Eufquina," near the place defined for the punishment of slaves, called "Seftertium," where were erected crouzes and gibbets, and where also the bodies of slaves were burnt, or thrown out unburied. The carnis (according to some), was anciently keeper of the prison under the triumviri capitales, who had only the superintendency, or care of it; hence, "tradero ad carnis," to imprison. In middle age writers carnis also denotes a butcher.


CARNIFICATION, in Surgery, is the conversion of bone into flesh; of which procex many examples are referred to, and described by medical writers; but in fact, this phenomenon consists only in the absorption of the phosphate of lime, or offensive matter of a bone, leaving the fi-
brous substance, and consequently producing a flexibility of
the bone. This is not strictly a transmutation of bone into
flesh, but merely a removal of one of the component parts
of bone: viz. that which gives firmness and liability to the
defensive fluid. See Mollities Ossium, and the article
Bone.

CARNIOLA, duchy of, in Geography, a country of
Austria, bounded on the north by Carnithia and Styria, on
the west by Friuli, the county of Goraz, and the Adriatic
Sea, on the south by Istria and the Adriatic, and on
the east by Dalmatia and Croatia. Its name “Krain,” or
“Crmnia,” was probably derived from Carnia, for which
the appellation Carniola was substituted, and used as early
as the 8th century. This duchy, in its greatest extent,
measures about 150 miles from east to west, and about 100
from north to south. The country is molly mountainous;
some of the mountains being naked, others clothed with
wood, and many of them continually covered with snow.
The principal of these mountains are the Caleberg, the
Lobel, or Lymbel, separating Carniola from Carnithia, and
affording from its summit a very fine prospect, the Krim-berg,
the Carl, or Kart, the Burhanmer-wald, anciently “Al-
pes Julic,” and “Alpes Carnicae,” (see Alps;) also a high
and wooden mountain extending from the rife of the Saue,
through Carniola, into the Turkish dominions, and contain-
ing in its lead breadth three German miles, and the high
mountain of Nana, lying between Wipach and St. Veit.
Among the mountains of this country there are many fruit-
ful valleys and fields, which yield not only good pallilage,
but excellent crops of corn, hemp, flax, and nollet. It af-
fords likewise good fruit for cyder and perry, chestnuts,
walnuts, olive trees, oranges, lemons, citrons, almonds, figs,
&c. and vines, the graps of which supply very good red
and white wine. The country also breeds horned cattle
and horses in great plenty, and furnishes all sorts of fowl
and venison, and also many kinds of fish. The mountains
yield iron, lead, and copper. The Carniolan marble is
reckoned beautiful. Carniola abounds with immense caves,
and other natural curiosities. The chief rivers are the Saue,
the Laybach, the Gurk, and the Conia; and the principal
inland lakes are the Kufelkr and Wochenein, and also Circknitzer Sea. It has 31 cities, Laybach being the
capital, 35 market-towns, 200 castles, 4000 villages, and
other settlements, 38 convents, 154 parishes, 60,100 inha-
bited houses, and 6775 uninhabited houses, 75,785 families,
1501 clergy, 401 nobles, 2269 burgburers and tradesmen,
and 43,600 peasants. The common people, who are robust
and hearty, are of Slavonian extraction, but the nobility are,
for the most part, German. Among the common inhabit-
ants, occupying different parts of the country, there is a
great difference of manners, dress, and language. The two
principal languages are the Slavonic or Wundish, and the
German. The Christian doctrine was introduced into Car-
niola about the latter half of the 8th century; and the La-
thene doctrine was admitted in the 16th century; but the
inhabitants are now principally Roman Catholics, besides
some members of the Greek church. The exports from Car-
niola are iron, flax, quicksilver, red and white wine,
olive oil, cattle, sheep, eucle, linen, a kind of woolen
stuff called “mabalan,” Spanish leather, honey, ship-tim-
ber, and every kind of wood-work, such as boxes, dikes,
trenchers, spoons, knives, &c. The Slavi, called also Winds,
or Wends, took possesion of this country after the
year 548. In the time of Charlemagne and his pohtery,
it was governed by the dukes of Friuli, and afterwards by
those of Carnithia; but under Otto II. it became a pecu-
liar margraviate, probably derived from Otto I. The fo-

CARNION, in Ancient Geography, a strong city of
Gilead, in Palæstine, belonging to the half tribe of Manasséh,
on the other side of Jordan. It was to this city that Ti-
mothæs sent all the women, children, and luggage, when
Judas Maccæus was in full march against him. Either
also, after the defeat of his army, and the loss of 70,000
men, who escaped the slaughter, being closely puz-
zed by the victorious army of Judas, retreated, and many
of them fought refuge in the temple of Atargatis. Judas,
however, burnt the temple and those who were sheltered in
it; and then setting fire to the rest of the city, they all
perished likewise, either by the flames, or by his sword,
and the number of 25,000. 2 Macab. xii.

CARNION, or CARNIUM, a town of Pelo-pomumus, in La-
conia. Polybius.—Also, the name of a small stream on the
southern part of Arcadia, which ran from the south-east
to the north-west, and discharged itself into the river Ga-
thenes.

CARNITZ, in Geography, a town of Germany, in the
circle of Upper Saxony, and duchy of Pomerania; 5 miles
N. of Greifenburg.

CARNIVAL, or CARNAVAL, a season of mirth and re-
jocicing, observed with great solemnity by the Italians,
and particularly at Venice.

The word is formed of the Italian carnavale; which Du
Cange derives from carn-a-val, because the flesh is then put
into the pot, in order to make amends for the feast of ab-
stinence ensuing. Accordingly, in the corrupt Latin, he ob-
erves, it was called carnelevatum, and carnephneum; as the
Spaniards still denominate it, carnes tolendas.

The carnival time commences from Twelfth-day, and
holds till Lent. Fools, balls, operas, masquerades, ridottos,
concerts of music, intrigues, marriages, &c. are chiefly
in carnival time. During the carnival, St. Mark's place is
the grand scene of riot and folly, where mountebanks and
various other impostors are allowed to erect their shags, and
to practice on the credulity of the crowds who assemble round them. See Venice.

CARNIVOROUS, in Zoology, an epithet generally ap-
plied to animals of every description that subsist for the
most part, or entirely, on animal food. In a more limited fene
we understand by carnivorous animals, those only of a
vage and voracious nature, affimulating in our ideas some in-
 distinguishing ferocity of character in the manners of those crea-

turers when seeking and attacking their prey, as well as actually feeding on flesh. We naturally conclude, for this reason, among the principal carnivorous animals the lion, the tiger, and the wolf; or among birds, the eagle, and the kite, with a host of other rapacious creatures, upon which nature has bestowed pre-eminent advantages of courage, strength, and arms to aid them in seizing upon, tearing into pieces, those animals on which they feed: they have either formidable canine teeth, or fangs; claws, or talons; the quadrupeds possessing both, and the birds the latter: fishes with very few exceptions are carnivorous, but their only offensive weapons are the teeth, or in some species the spines and prickles disposed on various parts of the body. Quadrupeds that feed both on flesh and vegetables are more or less deficient with respect to those characters by which carnivorous quadrupeds are known; and those still more so to that of the teeth entirely on roots, barks, fruits, grubs, or other vegetables: the brute have no cutting teeth either in the upper or lower jaw; the recour have them only in the lower jaw; and the front teeth of the hulse are obtuse;—the food of those animals is vegetables.

Deferrall, and other modern French writers on zoology, form a distinct subdivision of their carnivorous; (an order of quadrupeds comprehending most of the Linnaean fera) under the title of carnivora. This subdivision comprises the three families of martins, cats, and dogs, in the following order. The first family, Meatans, or martes, contains five genera; namely, foricate, mangevole, marte, mouflette, and lourte. Suricate is a genus formed only of a solitary species, viverra tetradactyla of Linnæus; the mangevole consists of Linnaean vivere, and marte of animals separated from both the Linnaean genera, viverra and mufelle. Mouflette consists of viverra mephitis. Linn. and other Linnaean species of viverra; and the last genus, lourte, comprises part of the muscle of Linn. and lura of Erxleben. The second family are Felins, comprehending the two genera, chat (felis, Linn.) and civette (viverra, Linn.) The third family, Cynodens, contain three genera, hyène, canis, (Linn. Linn.) furnace, consisting only of one species, (canis corvo, Linn.) and chien. (canis of Linneus,) including the common dog, familiaris, wolf, lupus, and fox, vulpes.

Carnivorous animals are characterized both by their internal organization and their capacity and inclination for the destruction of their prey; their teeth are sharp and pointed, even though intimated in the back part of the mouth; and these teeth, denominated canis, are so long in most of the brutes of prey, that they pass a considerable way beyond each other when the jaws are closed. The disposition of the enamel which is confined to the surfaces of the teeth, renders them extremely hard, and this circumstance, joined to an extraordinary bulk of those muscles, employed in raising the lower jaw, give to carnivorous quadrupeds the power of breaking the strongest bones. The rapacious birds are distinguished by a sharp hard bill, furnished on each side with a pointed procys, by which they are enabled to tear and plunder the parts of the animals they feed upon.

As the digestion of animal substances is accomplished in a short time, the fluorish of the carnivorous tribes has a simple figure without any process or separations of its cavity to retain its contents, or to delay their passage into the intestines; and as animal food furnishes but little excrement, the intestinal canal is short, and either totally unprovided with those dilatations, which are so remarkable in vegetable eaters, or possesse them only in a flight degree.

Carnivorous animals are further distinguished by the extraordinary strength of their members, which are commonly furnished with sharp claws; these are so contrived, both in the beaks of prey, and the avianiting birds, that they turn inwards by the flexion of the bill, for the action of seizing any thing, and are retracted by the tension of the toes; thus giving facility and certainty to the capture and retention of fugitive animals.

The tribes of assen and fess are particularly acute in the carnivorous tribes, as it is by means of them that they discover or seek out their prey.

Carnivorous animals are usually cruel and treacherous in their dispositions; they are even inured with respect to their own species; and hence it is that their numbers are few in comparison to that of the herbivorous kind: if it were not for this wise ordinance of nature, the defenseless orders of animals would soon be devoured, and the carnivorous would become the prey of each other.

It is a dispute among naturalists, whether or not man be naturally carnivorous? Some contend that the fruits of the earth were intended as his sole food; and that it was necessity in some places, and luxury in others, that first prompted him to feed upon his fellow animals. Pythagoras and his followers looked upon it as a great impiety; and briefly abominated from all flesh, from the notion of a metamorphosis of plants and their foodstuffs. The Brummies, continue the fame to this day. The consideration Gallenus chiefly inflicts on, why man should not be carnivorous, is the structure and conformation of our teeth; most of them being either incisors or molitors; not such as carnivorous animals are furnished with, proper to tear flesh; except the bone carnivum, as if nature had rather prepared us for cutting herbs, roots, &c. than for cutting meat. To which may be added, that when we feed on flesh, if not without a preparatory coction, by boiling, roasting, &c.

'To these arguments, Dr. Wallis joins another; which is, that all quadrupeds which feed on herbs or plants have a long colon, with a cecum at the upper end of it, or some what equivalent, which conveys the food, by a long and large progress, from the stomac down wards, in order to its flower passage and longer stay in the intestines. In man, the cecum is very visible: a strong presumption that nature, which is still consistent with herself, did not intend him for a carnivorous animal.

To the arguments used by Dr. Wallis and others, to prove that man is not naturally carnivorous, Dr. Tyfon aufwers, that if man had been designed by nature not to be carnivorous, there would doubtless have been found somewhere on the globe, people who do not feed on flesh; and as history seems not to furnish any instance of this kind, may we not say, that what is done universally by the whole species, is natural? For what the Pythagoreans did in abstaining from flesh, was on the principle of a transmigration, a mistake in their philosophy, not a law of nature; and though in some countries man feed more sparingly on flesh than in others, this is owing to their own choice, or from religious prejudices. He adds, that carnivorous animals are not always without a colon and cecem; nor are all animals carnivorous which have those parts; but that the Sarische, or toffum, for instance, has, both a colon and a cecum, yet feeds on poultry, and other flesh; whereas the hedges-hog has neither colon nor cecum, and therefore ought to be carnivorous, yet it feeds principally on vegetables. And, that those animals which have both, will feed on flesh greedily enough when they can get it; and that rats and mice, which have large cecem, feed on bacon, as well as bread and cheese.

And, from the multitude of carnivorous animals which want those parts, and of non-carnivorous, which have one or both, no safe conclusion can be drawn; since we might as well argue, that because the neat-kind, lag kind, goat-kind,
kind, and sheep-kind, which live on herbage, have four stomachs, therefore all those which have not four stomachs were not diluted by nature to be graminivorous; whereas the horse kind and hare-kind have but one stomach, yet feed on grasses like the former; and, in that many animals which live on the same sort of food, the structure of the stomach is found very different; and that in others which live on different food, on fish, on fruits, on grasses, &c., the stomachs are found to be, that it is difficult to assign any difference between them: and if we cannot make a judgment what food is most natural to an animal from the structure of its stomach, which is the part most concerned in digesting it, much less can we judge from the colon or cecum, which are parts remote from the stomach, and seem rather as an echo for the reception of a species, than of use for digesting or distributing the food.

In this, however, as in most other conclusions, truth lies between the two extremes; there is an obvious connexion between the conformation of the teeth, stomach, and intestines, and the nature of the food upon which an animal subsists: and according to the rules laid down by comparative anatomists on this subject, man was designed to use a mixed food in common; but if circumstances required it, his organs were adapted to digest either animal or vegetable substances. His teeth are neither calculated for grinding coarse vegetable food, nor for tearing the flesh, or breaking the bones of animals: they are only fitted for masticating such matter when divided by machinery, or prepared by the operation of heat, in the several processes of cooking.

The stomach of man is not very capacious; he does not need a referrer, even when subduing exclusively upon vegetables, as his invention always furnishes him with the means of extracting the most nutritious parts; and, on the other hand, his stomach is formed to retain its contents for some time: if it were otherwise constructed, it would only be qualified for the consumption of animal matter.

Further, his intestines, with respect to length and capacity, hold a middle place between those of graminivorous and carnivorous animals, or rather more like the latter, on account of the degree of preparation to which we submit vegetable substances, previous to our eating them, in order to get rid of their indigestible parts.

These observations are consistent with daily observation and experience. The lower classes of people in almost all civilized nations live chiefly upon vegetable diet, and yet no rank in society possesses more bodily strength; and, on the other hand, the inhabitants of those countries in which no staples have been taken to cultivate the soil, subsist almost entirely upon the beasts they hunt down, or the fish their seas or rivers afford.

Man, therefore, in different circumstances, and in different states of society, may be either graminivorous, carnivorous, or omnivorous.

CARNUS, in Chronology, the Syracusan name for the Athenian month Metagistion; which was the second of their year, and answered to the latter part of our July and beginning of August.

CARNO, in Geography, a river of North Wales, which runs into the Severn, in Montgomeryshire.

CARNÉT, or Carnet, a town of France, in the department of the north coal, and district of Guingamp, containing about 1100 inhabitants; 6 leagues S.W. from Guingamp.

CARNONACÉ, in Ancient Geography, a people of the north-western part of Ancient Britain, placed by Ptolemy between the Creones and the Carenici, and occupying, according to Baxter, that part of the Meine which is called Affenthire.
CAR

Cyprian. He also translated the Ballads of Longus and Ariosto's History of Animals which was left unprinted. Patronized by the Ferrerse family, he was enabled to collect a rich cabinet of medals, on which he wrote an extensive treatise that was never printed. His familiar letters are esteemed the most perfect models of ease and elegance in epistolary writing. His Italian poetry has been commended; and his canzonets and sonnets have been particularly celebrated. One of these poetical pieces to the honour of the royal house of France, produced a literary dispute of a very virulent and serious nature. By some severe criticism passed upon it by Ludovico Castelvetro, a celebrated grammarian, Caro was so provoked, that he wrote a reply so infamous and libellous as to fix an indelible stain on his memory, both as a man and a Chiruken. Castelvetro was accused of procuring the assassination of a young friend of Caro, and Caro was suspected of having used means for subverting Castelvetro to the inquisition which occasioned his exile from his native country, and the hazard of his life. After the termination of this disgraceful and dreadful quarrel, Caro retired to a small villa at Fercate, where he spent his latter days chiefly in a translation of Virgil's Eclogues into blank verse, which has been highly applauded, and ranked among those performances which do the greatest honour to Italian literature. It was first published at Venice in 1581; one of the best editions is that of 1705. The "Poems" of Caro were printed at Venice in 1584, 4to. His "Letters" were reprinted at Padua in 1749, 3 vols. Svo. Tiraboschi, Nouv. Dict. Hill.

CARO, St. Hugo de. See Concordance.

CAROB TREE, in Botany. See Ceratonia Siliqua.

Carob is also a goldsmith's small weight, amounting to the 24th part of a grain. It is also called prime.

CARCEDO, in Geography, a town of Portugal, in the province of Tras os Montes; 6 miles S. of Outeiro.

CAROCH, a name which the Spaniards and Portuguese give to a kind of mitre made of paper or pasteboard, on which are painted flames of fire, and figures of demons, worn by those who are condemned to death by the tribunal of the Inquisition. See Act of Faith.

CAROENON, in Antiquity, espousals, or Carenum, names given by the Greeks and Romans to wine boiled over a slow fire, till only a half, third, or fourth part remained, and then mixed with honey or spicers. Wine thus improved acquired several other names, such as muslin, malvin, fapa defratum, &c. At this time the same operation is performed with respect to, Spanish, Hungarian, and Italian wines. In Italy, new wine which has been thus boiled, is put into flasks, and used for fallad and sauces. In Naples, it is called "mullo collo," but in Florence it still retains the name of "fapa," Plin. I. xxii. c. 2. Columella, de re rustica, l. xii. c. 25.

CAROLA, Ital. This musical term in Boccaccio, is synonymous with Bollata, which the Cruda Dictionary defines, Cenone che fi carda ballando, "a song which is sung and danced at the same time," See Ballad. It is the sene in which the word Karole is constantly used by Chaucer.

These folks of which I tell you so Upon a bale we went in the; A ladie balest hem' that bight Gladness the blissful and the light, Well could the sung and lutfy, None half so well and semetey— And course enough for forthe doing.
In 1710 the number of inhabitants in this state was computed at 6,000; in 1727 at 270,000; in 1794 at 391,751, of whom 100,742 persons were slaves; and in 1805, the number was 471,785, being about 55 persons to each square mile. Of these, 171,768 were white males, 166,116 white females, 137,286 slaves, 7,043 free blacks and mulattoes; and there appears to have been in 10 years an increase of 49,549 whites and 39,793 blacks; &c. or upon the whole of 895,552. The militia of this state consists of 50,000 men.

The principal towns of North Carolina are Newbern, the largest, Edenton, Wilmington, Halifax, Hillsborough, and Fayetteville; each of which has, in its turn, been the seat of the general assembly, and the capital of the state. But Raleigh, which is situated in Wake's county, near the centre of the country, (N. lat. 35° 56'. W. long. 79° 11') has lately been established as the metropolis. The chief rivers of this state are Chowan and its branches, Roanoke, Tar Neus, and Cape Fear, or Clarendon. Most of these, as well as the smaller rivers, have bars at their mouths; and the coast affords no good harbour except cape Fear. The most remarkable swamps in this country are those in Currituck county and on the line between this state and Virginia. See Dismal. The most noted founds are Albemarle, Pamlico, and Core founds; and the capes are Look-out, Hatteras, and Fear. See their respective names.

North Carolina is, through its whole extent for 60 miles from the sea, a dead level, and the greater part of this space is for the most part covered with small trees and bushes. On the banks of some of the rivers, particularly the Roanoke, the land is fertile and productive; and in the other parts there are interfingered glades of rich swamp, and ridges of oak land, of a black, fruitful soil. Through this whole level country marine productions are found in depths of 18 or 20 feet below the surface of the ground. At the distance of 60 or 80 miles from the sea, the country rises into hills and mountains, as in South Carolina and Georgia, which fee. That part of North Carolina which lies W. of the mountains is a tract, about 500 miles long from east to west, and upwards of 100 miles in breadth, of fine fertile country, watered by the Tenefee, abounding with oaks, several kinds of locust trees, walnut, elm, lime, and cherry trees of large size, some of them being three feet in diameter. See Tennessee. Wheat, rye, barley, oats, and flax, thrive in the back hilly country; and Indian corn and puffs of all kinds, in all parts. Cotton and hemp are also cultivated in a considerable degree, and might be raised in greater abundance; the cotton is planted annually; the flax dying with the fruit. One man's labour will produce 1000 pounds in the seeds, or 250 fit for manufacturing. The natural growth of the pines is almost universally pitch-pine, which may be called the staple commodity of North Carolina, as it affords various articles constituting about one-half of the exports of this state. White and red oak are excellent and abundant; and the swamps furnish cypress and bay trees in great plenty. The most common kinds of timber in the back country are oak, walnut, and pine; and in the moist gravelly soil is a species of oak, called "black jack." The most common is the black oak. The principal wild fruits are plums, grapes, straw-berrys, and black-berrys. The country also abounds with medicinal plants and roots; such as the gingseng, Virginia snake root, Seneca snake root, and an herb of the cometic kind renfubing ipecacuanha. The rich bottoms are overgrown with canes. The produce of the back country, consisting of tobacco, wheat, Indian corn, &c. is chiefly carried to market in South Carolina and Virginia. The southern interior counties carry their produce to Charleston, and the northern to Petersburg in Virginia. The exports from the lower parts of the state are tar, pitch, turpentine, relin, Indian corn, boards, scantlings, flax, staves, fuirs, tobacco, pork, lead, tallow, bees-wax, myrtle-wax, &c. In which articles a trade is carried on chiefly with the West Indies and the northern states. From the latter they receive flour, cheese, cyder, apples, potatoes, iron wares, cabinet wares, hats, and dry goods of all kinds imported from great Britain, France, Holland, &c.; and from the West Indies, rum, sugar, and coffee. The exports in the year ending September the 30th 1791 amounted to 524,548 dollars; but in 1805, those of the domestic produce amounted to 915,545, and of the foreign to 9,145, being in the whole 928,570 dollars.

In the flat country near the sea-coast the inhabitants are subject, in summer and autumn, to intermittent fevers, which are often fatal; but the western hilly parts of the state are as healthy as any parts of the United States. The country is fertile, and full of springs and rivulets of pure water. The air is serene; and though the days are very hot, the nights are cool and refreshing. Autumn is very pleasant, and the winters are generally very mild; upon the whole, many of the inhabitants live to old age. Wheat harvest commences with June, and that of Indian corn is early in September.

The western parts of this state, which have been settled within the last 40 years, are chiefly inhabited by Presbyterians from Pennsylvania, the descendants of emigrants from the north of Ireland, and are very much attached to the doctrines, discipline, and usages of the church of Scotland. They are regular and industrious. Some settlements of Germans, both Lutherans and Calvinists, are interposed. The Moravians have several flourishing settlements in the upper part of this state, the principal of which are in Wachovia county in the county of Surry, so called after an estate of count Zinzendorf in Austria; and particularly at Salem. The Quakers have a settlement at New Garden, in the county of Guilford, and several congregations at Perguinus and Palmetto. The Methodists and Baptists are also numerous and increasing. The inhabitants of Wilmington, Newbern, Edenton, and Halifax districts, constituting about three-fifths of the state, once professed themselves of the episcopal church; but many of them, during the progress of the late war between Britain and America, emigrated; and the material changes have since occurred. In December 1789, the general assembly of North Carolina passed a law, incorporating 40 gentlemen, viz. five from each district, as trustees of the university of this state, and it has been since liberally endowed. There are also academies at Warenton, Williamborough, and some others.

As to the habits and manners of the North-Carolinitians, we may observe, that they are mostly planters, and live at a distance from one another of one mile to three or four miles, on their respective plantations. Their country is plentiful; but they have little intercourse with strangers; however, they are fond of society and hospitable to travellers. In the lower districts of the country they have but few places for public and weekly worship of any kind, and for want of ministers, these are neglected. The inhabitants of this state appear to have as little taste for the sciences as for religion; and it is remarked, that little attention and respect are paid to the women here than in those parts of the United States where the inhabitants have made greater progress in the arts of civilized life. Temperance and industry are not reconned among the virtues of this state; and much time is consumed in drinking, idleness, and gaming at cards or dice; and also in cock-fighting and horse-racing. Many of the interludes are filled up with boxing-matches, in which persons vie.
wails the brutal practice of "gouging," a species of diversification, if it may be so called, which is thus performed:—when two boxers are worried with fighting and brawling each other, they come, as it is called, to clubs, quarter and each endeavour to twist his fore-fingers in the ear-hooks of his antagonist. When these are fast clenched, the thumbs are extended each way to the nose, and the even slowly turned out of their sockets. The victor, for his expertness, receives shouts of applause from the sporting throng, while his poor eyes and antagonist is laughed at for his misfortune. This barbarous practice, which we could hardly suppose to have existed, is said to be prevalent among the lower classes of people in both the Carolinas, and also in Georgia.

By the constitution of this state, which was ratified in December, 1776, the legislative authority is vested in two different branches, viz. a senate and house of commons, which, convened for business, are styled the general assembly. The senate is composed of representatives, one for each county, chosen annually by ballot; and the house of commons consists of representatives chosen in the same manner, two for each county, and one for each of the townships. The qualifications of a senator are one year's residence prior to his election in the county for which he is chosen, and a freehold of 500 acres; and those of a member of the house of commons are the same residence and a freehold of 100 acres, or such a tenure for the term of his own life. A freeman of 21 years of age, who has been an inhabitant in the state for 12 months immediately preceding the day of election, and who has possessed a freehold of 50 acres within the state for six months next before, and at the day of election, is entitled to a vote for a senator; and all freemen, 21 years of age, who have been inhabitants the year next before the election, and who have paid public taxes, may vote for a member of the house of commons. Judges of the superior court, members of council; judges of admiralty; treasurers; secretaries; attorney generals for the state; clerks of record; clergymen; persons denying the being of a God, the truth of the Protestant religion, or the divine authority of the Old or New Testament; receivers of public monies, whose accounts are unsettled; and military officers in actual service, are ineligible to a seat either in the senate or in the house of commons. The senate and house of commons, or general assembly, annually elect by ballot the governor, who must be 30 years of age, a resident five years, and possess a freehold worth 1000L, and who is ineligible to the office for a longer time than three years in five successive years. The assembly also elects seven persons to be a council of state for one year, with whose advice the governor may grant pardons, except for crimes prosecuted by the assembly, fill vacancies in office till the ensuing feoffon, and lay embarrasses. The governor is liable to impeachment and prosecution in the supreme court for mal-administration. The salary of the governor is dependent on the legislature. The general assembly appoints the treasurer, the secretary. Judges of the supreme courts of law and equity, judges of admiralty, the attorney general, and all the superior military officers, who hold their offices during good behaviour, and are removable by conviction in the supreme court. All bills must also be prepared by the general assembly, and they must be read three times in each house, and be signed by the speakers of both houses, before they pass into laws. Justices of the peace, recommended by the representatives, are commissioned by the governor, and hold their offices during good behaviour. The constitution allows of no religious establishment. The representatives of this state in congress are 12; and the senators are two.

The history of this state in the earliest period of its settlement is confounded with that of South Carolina, from which it was not separated so as to be entitled to a distinct province till the year 1728; and the appropriate boundaries of it cannot be accurately ascertained. See the next article. The first permanent settlement in North Carolina seems to have been made about the year 1729, when a number of Palatines from Germany, who had been reduced to very indigent and distressed circumstances by a calamitous war, were conveyed thither. The proprietors of Carolina, hoping to derive advantage from their labour in the cultivation of their lands, resolved to afford every possible encouragement to such emigrants. Accordingly ships were provided for their transportation and upon their arrival Governor Tryon granted them a tract of land in that province, since called Albemarle and Bath precincts, from which they settled and hoped to have found an unqualified retreat, though in a kind of wilderness, from the devastations of a war, which then raged in Europe. It was not long, however, before their calamities were renewed by a dangerous conspiracy formed against them in 1732 by the Coree and Tuscorora tribes of Indians. The attack was secret and unexpected; and the massacre of the inhabitants was as general and bloody as it was sudden. Some few escaped the indiscriminate slaughter and gave the alarm; and as soon as the news of the sad disaster had reached the province of South Carolina, governor Craven dispatched a force to their relief. The Tuscororas were defeated; many of them were killed, and others taken prisoners. The remainder of the tribe, having lost about a thousand of their original number, soon after abandoned the country, and joined the five nations, with which they have ever since remained. The infant colony from this time remained in peace, and continued to flourish under the general government of South Carolina, till about the year 1729, when seven of the proprietors accepted 25,000L. from the crown, and surrendered its property and jurisdiction. This agreement between the proprietors and the crown was ratified by act of parliament, in 1729; a clause in the act referring to lord Granville, one of the proprietors, his eighth share, which continued legally vested in his family till the revolution in 1776. Lord Granville's share formed a part of the present state of North Carolina. About the year 1729, the extensive territory belonging to the proprietors was divided into North and South Carolinas; and the limits of the former were ascertained and established by an order of George II. Accordingly they remained separate royal governments till they became independent states.

Carolina, South, one of the United States of America, bounded on the north by North Carolina, on the east by the Atlantic Ocean, and on the south and south-west by the Savannah river, and a branch of its head water, called Tugaloo river, which divides this state from Georgia. The western boundary has not yet been accurately ascertained. It lies between 33° and 35° N. lat., and between 79° and 82° 30' W. long.; extending in length about 500 miles, in breadth 150, and containing 25,000 square miles, of which 107,500 acres are improved land. It is divided into nine districts. Charleston, Beaufort, and Georgetown, constitute what is called the "Lower Country," and contain 19 parishes, and 28,694 white inhabitants; and the legislature 70 representatives, and 20 senators, and pay taxes to the amount of 28,831. 5s. 11d. Ninety-six districts, Washington, Pinckney, Camden, Orangeburg, and Cherokee districts are comprehended in the "Upper Country," and contain 23 counties, and 110,902 white inhabitants;
fend to the legislature 54 representatives, and 17 senators, and pay taxes to the amount of $8,920. 28. 30. Sec each of the above articles. The inequality of representation is very obvious; and attempts have been made by the upper districts to rectify it. By a late arrangement the name of county is given to the subdivision of these districts only, in which county courts are established. In the lower districts the subdivisions are called parishes and introduced merely for the purpose of electing the members of the legislature of the state. The whole number of inhabitants in 1787 amounted to 180,000; in 1801 to 240,000; in 1805 to 340,500, being about 14 per sons to each square mile, and including 100,616 white males, 95,319 white females, 146,411 slaves, and 3,185 free blacks and mulattoes. In 10 years the increase of whites has been 15,077, of blacks, 40,644; so that the whole increase has been 65,518. The militia has consisted of 35,753 persons. The capital of South Carolina is Columbia, seated on the Congaree river, in N. lat. 34° 14', W. long. 80° 57', and containing 100 houses and 700 inhabitants. Charleston is also a town of note. The only harbours of any note are those of Charleston, Port-royal, and George-town. The islands that border the sea-coast of this state are numerous and convenient; and serve many useful purposes of navigation. The north part of the harbour of Charleston is formed by Bull's, Dewees's, and Sullivan's islands. Opposite to Charleston, on the other side of the harbour, is James' island, which is the residence of about 50 families. Further south-west is John's island, larger than James'; and these two islands are separated by Stono river, which forms a convenient and safe harbour. Connected with John's island by a bridge is Wadmelaw, having to the east the small islands of Keywaw and Simmon. Between these and Edisto island is North Edisto inlet, which affords a good harbour for small vessels. South of Edisto island is South Edisto inlet through which enter, from the northward, all vessels bound to Beaufort, Afheepoo, Combahee, and Coo-law. On the S.W. side of St. Helena island lies a cluster of islands, one of the largest of which is Port-royal; adjacent to which lie St. Helena, Ladies island, Paris island, and the Hunting islands, being five or six in number and deriving their name from the deer and wild game found upon them. Beyond Broad river is Hilton Head, the most southern sea island in Carolina. West and south-west of Hilton Head lie Pinckney's, Bull's, Dawfulkies', and some smaller islands, between which and Hilton Head are Calibogue river and found, which form the outlet of May and New rivers. The soil on these islands is in general better adapted to the culture of indigo and cotton than the mainland; but lends adapted to rice. The natural produce is the live oak, excellent for ship-timber, besides the pimento or cabbage tree to useful in the construction of forts. The principal rivers of this state, which are navigable, are the Savannah, the Edisto, the Santee, and the Pedee, with their branches; which feed respectively. Thes of a secondary size, being such as occur when you pass from north to south, are Wakkamaw, Black, Cooper, Afheepoo, and Combahee rivers. To the third class we may refer those which extend a short distance from the sea, and by branch ing off into various creeks serve as drains to the inland swamps, or are merely arms of the sea. The tide flows in no part of the state above 25 miles from the sea. Canals are executed, projected, or begun for connecting Cooper and Santee rivers, and for uniting the Edisto with the Alb ley; and it is also proposed to make a waggon-way from the settlements in South Carolina over the mountains to Knoxville, in the state of Tennessee.

This country, with the exception of the high hills of Santee, the Ridge, and some few other hills, is like one extensive plain, till you reach the Tryon and Hog-back mountains, 220 miles N.W. of Charleston. The elevation of these mountains above their base is 38½ feet, and above the sea-coast 454. The mountains west and north-west of these rise much higher, and form a ridge which separates the waters of Tennessee and Santee rivers. The whole state, to the distance of 55 or 200 miles from the sea, is in general low and level, and abounds more or less, especially near the rivers, with swamps or marshes, which are capable of being cleared and cultivated, and which then yield in favourable seasons, an annual income of from 20 to 40 dollars per acre. In the distance more mentioned, the land rises by a gradual ascent from the sea-coast about 150 feet. The traveller, as he proceeds in a W.N.W. course from Charleston, meets with a succession of sand hills, bearing little herbage and a few small pines. The inhabitants are few, and find a scanty subsistence in their corn and potatoes. About 140 miles from Charleston in this direction is the "Ridge" which is a fine high, healthy belt of land, well watered, and with a good soil, and extending from the Savannah to Broad River, in about 60° 30' W. longitude from Philadelphia. Beyond this ridge commences a country exactly resembling the Northern states, Devonshire in England, or Languedoc in France, where hills and dales variously intersected display their verdure and beauty. Wheat fields are common; and the air is found to be much more temperate and healthful than near the sea. The hills are covered with valuable woods, the valleys are watered with beautiful rivers, and the fertility of the soil is equal to every vegetable production. This is called, by way of distinction, the "Upper Country;" and the inhabitants are actually distinguished by their manners and modes of life, their tones of speaking, and the articles which they cultivate. The land still rises as you advance; and at the distance of 220 miles in a north-west direction from Charleston, the elevation of the land above the sea-coast is found to be 500 feet. Here commences a mountainous country, which continues to the western termination of the state. There are four kinds of soil; the pine barren, merely valuable for its timber; with intermixed tracts of land producing only grass; these are called "Savannahs" and furnish a second kind of soil, good for grazing. The third kind is that of the swamps and low grounds on the rivers, which is a mixture of black loam and fat clay, producing naturally and in abundance cane, and also cypris, bays, lobolly pines, &c. The high lands, commonly known by the name of Oak and Hickory lands, constitute the fourth kind of soil, which yields oak, hickory, walnut, pine, and locust. On these lands, in the low country, is cultivated principally Indian corn; and in the back country they also raise tobacco in large quantities, wheat, rye, barley, oats, hemp, flax, and cotton. It is, moreover, well ascertained that olives, silk, and madder may be as abundantly produced in South Carolina (and also in Georgia) as in the south of France. There is little fruit in this state: they have indeed oranges which are four, plenty of figs, a few limes and lemons, pomegranates, pears, and peaches; apples are scarce, but melons are raised in perfection. The river and inland swamps, especially those within the reach of the tide, are well adapted to the culture and growth of rice; the swamps above the head of the tide are occasionally planted with corn, cotton, and indigo; the soil is very rich, yielding from 40 to 50 bushels of corn per acre. It is curious to observe, that in the islands near the sea-coast, and for 40 or 50 miles withinland, and on the rivers much farther, the cultivators are all slaves. No white man cultivates a farm without negroes. The articles produced are corn, rye,
rye, oats, pulse of every kind, potatoes, which, with the small rice, are the food of the negroes; rice, indigo, hemp, and cotton, are for exportation. The plough and harrow are now introduced in the tillage of the land, together with other agricultural improvements. In the middle settlements, the negroes are less numerous; the land is not well adapted to rice; it produces tolerably good indigo weed, and tobacco for exportation; the farmer contents himself with raising corn, potatoes, oats, rye, poultry, and a little wheat. In the upper country, there are few negroes: the plough is almost wholly used; and the farmer depends for subsistence upon his own labour and that of his family. Indian corn, wheat, rye, barley, oats, potatoes, &c. are raised for food; white cotton, hemp, flax, and indigo for exportation. Vines may be cultivated to great advantage; and a great variety of medicinal herbs and roots, as snake root, pink root, ginseng, &c. is furnished in various parts of the state. This country abounds with precious ores, such as gold, silver, lead, black lead, copper, and iron. There are also several pelliculous flakes of different hues, rock crysall, pyrites, petrified substances, coarse carnelian, beautifully variegated marble, vetricious flone and sand, red and yellow ochers, potter's clay, fuller's earth, chalk, crude alum, sulphur, nitre, and vitriol.

The iron works of this country, called the "Aera Aetna iron-work," are situated in York county, within two miles of the Catawba river. The Aera furnace was built in 1787, and the Aetna in 1788. Mr. W. Hill, one of the proprietors of the works, has contrived, by means of a fall of water, to blow all the fires of the forges and furnaces, so as to render unnecessary the use of wheels, cylinders, or any other kind of bellows. The machinery for this purpose is simple and cheap.

In the middle, and especially in the upper country, the people manufacture their own cotton and woollen cloths, and most of their tools for husbandry; but in the lower country, they depend on being supplied by the merchants.

This state furnishes all materials of the belt kind for ship-building. The live oak, and the pitch and yellow pines, are of a superior quality. The indigo manufactured in this country will soon rival that of the French. For the encouragement of emigrants it has been announced that a monopoly capital may be profitably employed in erecting mills, for making paper, for sawing timber, and especially for manufacturing wheat-door; in tanning and manufacturing leather, cattle being easily raised and of cattle hides being very cheap; in making bricks, and in making pot-ash.

The state of education, and, of course, literature, deserves greater encouragement than they have yet found in this state. However, respectable academies have been established in Charleston, Beaufort, Port Royal island, and in other parts of the country. Three colleges have been incorporated by law, one at Charleston, one at Winniborough, in the district of Camden, and the other at Cambridge, in the district of Ninety-six. Farther improvement in this respect may be reasonably expected, as the legislature in 1795 appointed a committee to consider the best means of establishing schools in the different parts of the state. Since the revolution, all denominations of Christians have been put upon an equal footing; and there have been no disputes between different religious sects. The people are allowed by the constitution to choose their own ministers, and they are required, when chosen, to subscribe a general declaration expressing their resolution to conform in their public instruction to the scriptures, to be diligent in the exercise of their ministerial functions, and to be attentive to their own conduct. The upper parts of this state are settled chiefly by Presbyterians, Baptists, and Methodists. The former, including the episcopal and independent churches, are the most numerous; the Lutherans rank next, and are succeeded, with regard to number, by the Baptists, Methodists, &c. The Carolinas are the only nation of Indians in this state; and they have but one town, called Catawba (which see). The Creeks and Cherokees, in the west, will retain their names and a portion of their ancient territories on the frontier of the state. The most noted nations among the aborigines of South Carolina were the Stonoee and Wolofee, the Pamatang, Apalachee, Conogarees, Eakes, and Yamolees, in the salt and in the centre, who are now either extinct, or mingled with other tribes. On the sea-coast the proportion of slaves far exceeds that of freemen, and this great part of the white population is found in the western parts of the state. The Carolinians, it is said, sooner arrive at maturity than the natives of colder climates; but though they are distinguished by quickness and vivacity of genius, they are generally deficient in that enterprize and perseverance, which are requisite for the highest attainments in the arts and sciences. As they inhabit a fertile country, cultivated by slaves, and producing plenty, they have few motives to enterprize. Their wealth furnishes them with the means of hospitality, in the use of which they are very liberal. In their manners the Carolinians are easy and affable, as well as polite and attentive to strangers. Although the ladies want the bloom of the north, they have an engaging delicacy in their appearance and manners, and many of them possess the polite and elegant accomplishments. The most fashionable amusement in this state is hunting; gaming of all kinds is more disconcerted among fashionable people in this than in any of the southern states. Twice a year however they have their horse-races. In the conduct of their funerals the people of the richer classes are less attentive to propriety than they are on other occasions; as wine, punch, and all kinds of liquors, tea, coffee, cakes, &c. are distributed in profusion, when they are assembled to render their last tribute of respect to the dead. The climate varies in different parts of this state. Along the sea coast bilious diseases and fevers of several kinds are prevalent between July and October. The fish are occasioned by a low, marshy country, which is overflowed for the sake of cultivating rice; but though a residence in or near the swamps is very injurious to health, it has been satisfactorily ascertained, that by merely removing 3 miles from them, into the pine land which occupies the middle ground between the rivers, the annual fevers may be avoided. The upper country, situated in the median between extreme heat and cold, is as healthful as any part of the United States.

The little attention that is paid to manufactures in this state occasions a great consumption of foreign imported articles; and yet the exports have a balance in favour of the state, except when there are large importations of negroes. The principal articles exported from this state are rice, indigo, tobacco, skins of various kinds, beef, pork, cotton, pitch, tar, rosin, turpentine, myrtle-wax, lumber, naval stores, cork, leather, pink-root, snake-root, ginseng, &c.; and in the most successful years, 140,000 barrels of rice, and 1,300,000 pounds of indigo have been exported in a year. In the year ending Sept. 30, 1791, the amount of exports from this state was $2,693,517 dollars 97 cents; in the year ending Sept. 1793, $2,988,492 dollars 49 cents; in 1805, the exports of domestic produce amounted to $5,142,100 dollars, and of foreign dation to $2,309,516 dollars, or in the whole to $7,451,616 dollars. At this time the shipping of the state comprehends 70,000 tons. The annual expenditure amounts to $173,000 dollars.

By the constitution, framed June 3, 1792, the legal vote authority...
authority consists of two branches, a "senate" and "house of representatives," styled "General Assembly." The senators are elected by the people for four years, with a biennial rotation of one-half; and it is required that they be thirty years old, resident five years, and possess a freehold worth £150, if inhabitants of the county where they are elected, or worth £1000, if they live elsewhere: the representatives are chosen for two years; and they must be twenty-one years of age, be resident three years, possess a freehold of five hundred acres and ten negroes, or real estate of £1250 value, if they live in the district; but if not resident, a freehold worth £500. The electors must be twenty-one years of age, be resident two years, and possess a freehold of fifty acres, or town lots, or make a payment of a tax of three shillings.

With the house of representatives originate money-bills, and they have the power of impeaching officers of state. It belongs to the senate to try impeachments; and conjointly with the other house to appoint commissioners of treasury, secretary, surveyor, and judge. All officers in the judiciary department are appointed by the General Assembly during good behaviour; and receive a stated salary; the sheriffs are appointed for four years. The executive branch consists of a governor and lieutenant-governor; the former, chosen by the legislature for two years, but re-eligible after an interval of four years, with a certain salary, must be thirty years of age, resident ten years, and possess an estate worth 1500 pounds sterling: to him it belongs to remit fines, if not particularly restricted; to reprove and pardon, except in cases of impeachment; and he is removable, upon conviction of mal-administration, by two thirds of the senate. The lieutenant-governor is elected at the same periods, with the same qualifications. This office has eight representatives in congress, and two senators.

The first settlement in Carolina seems to have been made during the troubles in France, subsequent to the reformation; when Jasper de Coligny, a principal commander of the protestant army, fitted out two ships, and sent them with a colony to America, under the command of Jean Ribaud, for the purpose of securing a retreat from persecution. Ribaud landed at that point which is now called Albemarle river, in North Carolina. This colony endured incredible hardships and was extirpated by the Spaniards. Towards the latter end of the reign of Queen Elizabeth, Sir Walter Raleigh made some unfortunate attempts to fix colonies in Carolina; and in 1668 Carolina, which had been formerly called Carolina, and also Georgia, were thought very proper for propagating silk, wine, pot-ashes, cochineal, &c. In 1670 King Charles I. made a grant to his attorney-general, Sir Robert Heath, and to his heirs, of the country called Carolina, including N. and S. Carolina, Georgia, &c.; and Sir Robert afterwards conveyed this province to the earl of Arundel, who was at the expense of planting several parts of it. But no permanent settlement seems to have been made in Carolina, till after the restoration of King Charles II., when this king granted by his first charter, dated March the 24th, 1662, to Edward Earl of Clarendon, then lord high chancellor of England, and seven others, all lands lying between the 31st and 30th degrees of North latitude, and extending westerly as far as the South Seas; and in 1665, a second charter was granted to the same persons, enlarging their boundaries as far as 29° N. lat. towards the south, and 30° 30' N. lat. towards the north. Of this extensive territory, the king constituted Lord Clarendon and the other seven persons absolute lords-proprietors, and invested them with all the necessary powers for plant-
CAR

COUNCIL, drawn up by the bishops of France, and first published in 1549, by M. de Talley, bishop of Meaux, under the title of Elia Phyrha.

CAROLINE, in Geography, a county of North America in Virginia, situate on the south side of Rappahannock river, which separates it from King George's county. It is about 40 miles square, and contains 17,489 inhabitants, including 10,202 slaves.—Also a town in this county; 6 miles S. of Port-royal.

CAROLINE, a county on the eastern shore of Maryland, bordering on D. havare flute to the back and containing 9,565 inhabitants, including 1,877 slaves. Its chief town is Dan-

ton.

CAROLINE ISLANDS, or, as they are sometimes called, the New Philippines, form the most extensive range of islands in the Pacific Ocean, and comprehend those that lie between about 138° and 165° E. longitude; and about 10° N. lat. This chain of islands appears to have been discovered by the Spaniards in 1686, and to have derived its name from the Spanish monarch Charles II. They are about 30 in number, and very populous, except three, that were uninhabited. The natives relish those of the Philippines, and chiefly live upon fish and cocoa-nuts; nor does their language seem to be very different. Each island, it is said, has its respective chief to whom it is subject, and all of them respect a monarch whose residence is at Lamurte. They believe in certain celestial spirits, and think they defend us in the sacred lake in Fallalo; but they have neither temples nor idols, nor any appearance of worship. Their dead are sometimes thrown into the sea, and others are interred, the grave being surrounded with a stone wall. The inhabitants of Yap, it is said, worship a kind of crocodile, and have their magicians. Polygamy is allowed, and the Tumul, or chief of the large island of Hogoleu had nine wives. Criminals are banished from one island to another. These islanders do not appear to have any instruments of music, yet their dances are accompanied with songs. Their only weapons are lances, armed with bone. Negro slaves are not unknown in this remote region; and in one or two of the islands the bread is said to be mingled: 29 Spaniards having been left on one of these islands, who are supposed to have married and settled. But their principal population seems to have been derived from the migrations of the fairer race from the Philippine islands, and farther eastward; and these were most probably occasioned by frosts of weather, which drove their canoes from island to island, and from one group to another, that had not been before people. The people of Ulrea are reported to be more civilized than the rest, and much to resemble those of the Pellews. The most confiderable of the Carolines is Hogoleu, about 50 miles in length and 40 in breadth. Next to this, but not above a third part of its size, is Yap, in the western extremity of the range. Some few small groups of islands have been discovered in the eastern extremities of this chain, which may be properly classed under the name denomination. In 1732, Caunva, a Jefuit missionary, was massacred with eight Spaniards in the isle of Mogmog. A particular chart of these islands has been constructed after that of this Jefuit, and the relations of other missionaries, which have been printed as a supplement to the "Histoire des Navigations aux Terres Australes," by De Brofies. See vol. ii. See also the Preliminary Discourse to the Missionary Voyage, p. 86.

CAROLINE Waters and Baths. See CARLSBAD.

CAROLINEA, in Botany, (in honour of Sophia Caro-

chira, Aubl. 1291. Juss. p. 179. Pachimar. Savigny in En-

Gen. Ch. Cyl. simple, one leaved, bell-shaped, very short, truncate, oblong, or furrowed, slightly emarginate between each furrow, to 33 to appear somewhat five toothed, sur-
rounded by five globular bodies at the base. Car. petals five, very long, stellate, nearly erect, concave, slowly acute, reflexed at the tip, united into the base of the cup x. thick, caluncous. Stam. filaments about 3252 shorter than the pet-
teals, united in their lower half into a tube, which includes the stem, divided into the middle into from 10 to 15 distinct bundles, which in their upper part are again divided into about as many capillary filaments; these filaments are at times single, but are most commonly held more than half way down, each divided bearing an anther; anthers upright, ob-
long, a little recurved. Pet. stem, furrowed; style filiform, the length of the filaments; stigmas five, lance-
late, acute. Br. sepals very large, egg-shaped, cori-

come followed, one-celled, opening at the summit with numerous valves. Seeds numerous, angular, thick, lying one

upon another.

Obs. The younger Linnæus attributes to his plant an inferior germ, and a two-celled pome, with twin seeds in each cell, whence Jussieu and Savigny have expressed a doubt whether it be the same with that of Aublet; but as he ex-
pressly quotes Aublet's figure, it seems most probable that his description is in these respects erroneous.


Sp. 1. C. princeps, Linn. Jun. Supp. p. 314. Mart. Wild. 1291. Swartz. Prod. 101. (Pachimar aquatica, Aubl. Guian. tab. 291, 292. Cavan. Diff. 3. tab. 72. fig. 1. Lam. Illift. Pl. 580.) "Leaves generally quinate; leaflets ovate-lanceolate." A large tree. Trunk much branched, from 15 to 20 feet high, 2 feet in diameter; bark ash-coloured; wood soft and spongy; branches spreading widely. Leaves digitate; common petiole six or seven inches long, with two stipules at the base; leaflets from three to five, acute, almost sfeilis, smooth, green, very entire, unequal in fize, the middle one often more than seven inches long. Flowers simple, more than a foot long, axillary, solitary; peduncles thick and very short; pe-
tals yellow, caducous; stamens red; anthers purple. Fruit resembling that of the cacao (theobroma), and thence called in Cayman the wild cacao. The seeds are edible, but as they are very flatulent when well taken, they are moft commonly roasted. A native of marily ground in Guiana.

2. C. infinitis, Mart. Wild. 1291. Swartz. (Bomax grandiflorum, Cavan. Diff. 5. p. 295. tab. 124. Fromager grandiflor, Lam. Encycl. "Bomax". Herrard. Mex. 63. with a figure.) See Bomax grandiflorum. The flowers of this species are so similar to those of the preceding, that Swartz seems to be justlyified in removing it from Bomax, under which it was formerly placed; but Savigny observs, that as he is not ac-
quainted with the fruit, he does not absolutely pronounce it either a Bomax or a Carolina, though he is moit inclined to the latter.

CARLOSTADT, or CARLOTTADT, ANDREW BO

DENSTEIN, in Biography, an eminent Lutheran divine, was a native of Carollat, or Carlstadt in Franconia, and having studied in Germany and Italy, he became canon, arch-

deacon, and theological professor at Wittenberg. When Luther took his degree of doctor in this university, in 1512, Carlostadt was dean; and as soon as the former began to

preach
preach against popery, the latter joined him and became his colleague. His temper, however, was ardent, and not a little inclined to enthusiasm; and, determined to extend the reformation, he took the opportunity of Luther's absence, in 1532, for this purpose, and excited a tumult at Wittenberg, by the suppression of private masses, the removal of images out of the churches, and the abolition of the law which imposed celibacy upon the clergy. In these measures, though Moleim charges him with imprudence and precipitance, he acted in conjunction with Bugenhague, Melancthon, Amulndorf, and others; and they were confirmed by the authority of the elector of Saxony. Luther, probably diff

A letter of the second Luther's used town river Caria. See Zurich, Botany, the wife. Nevertheless, and of my R took Geography, extend again Mose's tumult branch the town 15. fnrd little berg, in though approving his having being adopted without his authority, broke with Carolllad on his return. Upon this the latter immediately retired to Orlamund; and attacking the opinion of Luther concerning the eucharist, widened the breach between them. Carolllad rejecting the absurd and unintelligible confabulation of Luther, represented this ordinance as a commemoration of Christ's death, and not as a celebration of his bodily presence; and in order to evade the difficulty attending the expression, "This is my body," he alleged, that Christ pointed to his own body, when he made this declaration, and not to the bread. Carolllad was the first Protestant divine who took a wife; and against this part of his conduct Luther could have had no objection, as he imitated his example. His fanaticism, however, was a just ground of complaint; for, though he did not adopt the most censurable opinions of Munzer and his anabaptist associates, and of those enthusiastic teachers, who pretended to a divine inspiration, he nevertheless inclined to favour them, and was actually chargeable with some extravagancies that were observable in their tenets and conduct. Accordingly he was an advocate for the abolition of the civil law, with the municipal laws and constitutions of the German empire, and he proposed substituting the law of Moses in their place. He also distinguished himself by railing at the academies, declaiming against human learning, and other follies. Having thus incurred the displeasure of Luther, he was commanded to leave the electorate of Saxony; and he repaired to Switzerland, where he successfully propagated his doctrines, first at Zurich, and afterwards at Basl; probably without that attachment to fanaticism, which had given offence; because, after his banishment from Saxony, he composed a treatise against enthusiasm in general, and against the extravagant tenets and violent proceedings of the anabaptists in particular. This treatise was addressed to Luther, and produced such an effect on the mind of this reformer, that he pleaded the cause of the exile, and obtained from the elector a permission for him to return to Saxony. After this reconciliation with Luther, he composed a treatise on the eucharist, which breathes the most amiable spirit of moderation and humility; and, having perused the writings of Zungling, in which his own sentiments on that subject are maintained with the greatest perspicuity and force of evidence, he repaired, a second time to Zurich, and from thence to Basl, where he was admitted to the offices of pastor and professor of divinity, and where, after having lived in the exemplary and conpliant practice of every Christian virtue, he died with the warmest effusions of piety and reparation, on the 29th of December, 1541. Nevertheless, his memory has been very unwarrantably reproached, and his character calumniated, by Morelli, Boffuet, and Roman Catholic writers. Moth. Eccl. Hist. by Machine, vol. iv.

CAROLOSTADITANS, or CARLOSTADITANS, in Ecclesiastical History, an ancient sect, or branch of Lutherans, who denied the real presence of Christ in the eucharist, so denominated from their leader Carollladian. See the preceding article. The Caroloctadians are the same with what are otherwise denominated SACRAMENTARIANS, and agree in most things with the Zuinglians.

CAROLSTADT, in Geography. See CARLESTADT.

CAROLUS, an ancient English broad piece of gold, struck under king Charles I. whole image and name it bears. Its value has been estimated at twenty-three shillings sterling; though at the time when it was coined, it is said to have been only rated at twenty shillings.

CAROULS is used for a small copper French coin, mixt with a little proportion of silver, first struck by Charles VIII. of France, whence it took its name; being, at the time when it ceased to be current, valued at six deniers.

CAROLY, or CARULY in Geography, one of the Laccadive islands in the Indian Sea, off the coast of Malabar. N. lat. 10° 3'. E. long. 72° 35'.

CAROMB, a town of France, in the country of Veainia, 3 miles from Carpentras.

CARO-MOELL, in Botany, Rheed. Mal. See SIDE-RONYLON.

CARON, in Geography, a town of Persia, in the province of Farisian: 75 miles S. of Sula.

CARONCULE, in Ornithology, the French name of the wattle finch, Sturias carunculatus.

CARONI, in Geography, a river of Dutch Guiana, or Surinam, which arises N. of the lake Parima, and flows into the Orinoco.

CARONIA, a town of Sicily, on the N. coast, in the valley of Debona, on a river of the same name; 5 miles N. of Milhetta.

CAROPELLA, a river of Italy, which runs into the gulf of Manfredonia, near Rioli.

CAROPI, in Botany, a name given by the inhabitants of the Philippine islands to a plant more usually known among authors by the name of Tugus, greatly esteemed by the natives, and suppos'd by Camelli to be the true amomum of the Greeks, to much valued in those ancient times.


CARORA, in Geography, a town of Terra Firma, in North America, about 110 miles N. E. from Gibraltar, on Maracaibo lake.

CAROTEEEL, in Matters of Commerce, denotes a certain weight or quantity of divers kinds of goods, ex. gr. of cloves, from four to five hundred weight; of currants, from five to nine hundred weight; of mace, about three hundred weight; and of nutmegs, from fix to seven and an half hundred weight.

CAROTIC is used by some writers to denote those who are feized with the Carots.

CAROTID, in Anatomy, from xxgus, to lay asleep; a name given to the large arteries which supply the head, from a mistaken notion that tying these vessels would induce sleep. There are two common carotid arteries, a right and left; of which the former is a branch of the carotid artery innominata, the latter arises from the arch of the aorta. Each of these vessels is again divided into an external and an internal carotid artery. For the description of these vessels, see Artery.

CAROTID CANDAL, is a winding passage in the petrous portion of the temporal bone, through which pass the internal carotid artery, and the branches of the carotid artery exter-

CAROTINO, or CAROTINO, is a painting of the carotid canal on the surface of the body cranii. See Skeleton.

CAROTO, GIOVANNI FRANCESCO, in Biography, a painter of history and portrait, was born at Verona in 1475, and...
and having learned the principles of the art from Liberale Veronefo, removed to Mantua and became a disciple of Andrea Mantegna. Under his instruction, he acquired a readiness in design and freedom of hand, which rendered him often superior to his master; and many of his compositions were taken for those of Andrea. In order to confute those who attempted to degrade him by asserting that he was incapable of painting in a large size, because he had principally delighted in small figures, he finished a noble design in the chapel of the Virgin at Verona, with figures as large as life; and thus established his reputation. He died in 1546. His brother, whom he had instructed, designed all the curious remains of antiquity in and near Verona, and particularly the amphitheatre, afterwards engraved and published. He was a good architect, and is said to have given lessons to Paolo Veronese. Pilkington.

CAROUGE, in Botany, see Ceratonia Silique.

CAROUGE, in Geography, a town in the department of Leman, and chief place of a canton, in the district of Geneva; the place contains 3250, and the canton 8,323, inhabitants: its territory includes 900 kilometres and 10 communes.

CAROUGE, Point, the northernmost extremity of the island of St. Domingo, in the West Indies; 25 miles N. from the town of St. Jago.

CAROUGE of Buffon, in Ornithology, the Bonana bird of English writers, Oridulus Bonana.

CAROUGES, or CARROUGES, in Geography, a town of France, in the department of the Orne, and chief place of a canton, in the district of Alençon; 4 leagues N.W. of Alençon. The place contains 1550, and the canton 15,130 inhabitants; the territory comprehends 300 kilometres and 25 communes.

CAROVIGNO, a town of Naples, in the province of Otranto; 3 miles E. of Otranto.

CAROUZE, a cape on the north coast of the island of St. Domingo. N. lat. 20° 59′. W. long. 76° 53′.


CARP, in Ichthyology. See Cyprinus.—Common Carp. See Cyprinus Carpio.

CARP, golden. Cyprinus Auratus, Gold Fish. See Auratus Cyprinus.

CARP-meals, a coarse kind of cloth, made in the northern parts of England.

CARP, fleshy, lata carpionis, a kind of gem said to be found in the fauces, by others in the back-bone, of the carp fish, about the size of a pea, of a triangular figure, and white colour without, but yellow within. It is supposed to be of use against the stone, and tubulations of the bile, being taken in powder, or held in the mouth.

CARP, in the Egyptian Dres, a sort of red cap turned up with fur, which borne make a curtain of wearing in common, though it is properly a part of the dres of the interpreters only, the same cap with muslin tied round it being more properly the common dres.

CARP, in Geography. See CARPATES.

CARPAEA, from Carpaea, a kind of dance or military exercise, in use among the Eôians and Magneians, performed by two persons; the one acting a labourer, the other a robber. The labourer, laying by his arms, goes to bowling and ploughing, still looking wary about him as if afraid of being surprized: the robber at length appears, and the labourer quitting his plough, betakes himself to his arms, and fights in defence of his oxen. The whole was performed to the sound of flutes and in cadence. Sometimes the robber was overcame and sometimes the labourer; the victor's reward being the oxen and plough. The design of this exercise was, to teach and accustom the peasants to defend themselves against the attack of robbers.

CARPAL, Ligament, of ligamentum carpi proprium, in Anatomy, is a strong ligament under which the flexor tendons of the fingers, and the median nerve, enter the palm of the hand. See Ligaments.

CARPAS, in Geography, a town near the southern point of the island of Cyprus, in the Mediterranean. It was anciently called Carpasia, by Pliny Carpasum, and by others Carasif.

CARPASIAE, in Ancient Geography, small islands, situated very near to the isle of Cyprus, and north of it, almost opposite to the town of Carpathia.

CARPASIAN, Ligament. See Linum Carpasum.

CARPASUM, in Geography, or Carpasum, in the Materia Medica of the ancients, the name of a poisonous gum, exuding from a tree, so like myrrh in appearance that many perished by the error of using it instead of myrrh, or mixed among it. We are at this time wholly ignorant of its nature; but that it was a gum exuding from a tree, is plain from the account of Dioscorides, who calls it opoparpsium, as do the flowing balm of Gilced, opoelphamn. The wood of the tree which produced it, he calls xylorpsium, in the same manner as the other wood is called xyloschamn. This wood was little used in furniture than the carpium, or gum itself. Galen tells us that the carpium was like myrrh of the very purest and finest kind; and that those people who were most curious of all to have fine myrrh, often met with the carpium among it, and gave death, instead of relief, to the persons to whom they administered it. We find, by the words of Galen, that this gum was not only like myrrh, but was also brought from the same place, and was often mixed with it. The finest myrrh usually had most of this poison among it, and we may collect from the same account that it was a sweet-scented gum, for otherwise no body could have mistaken it for myrrh. Galen de Med. Simpl. lib. vii.

CARPATES, in Ancient Geography, the name given to a long chain of mountains, which terminated European Sar-matia on the southern side; now called the Carpathian Mountains.

CARPATHIAN MOUNTAINS, in Geography, a grand and extensive chain, which bounds Hungary on the north and east, and which are called by the Germans the mountains of "Kropak," probably the original name, but softened by the Russian euphoniism. The Hungarians call them "Tatra." This enormous ridge extends in a semicircular form from the mountain of Javervick south of Silesia towards the north-west. But at the mountain of Trofeika, the most northern summit, it bends to the south-east, to the confines of the Black Sea, where it extends forth two branches, one to the south and another to the west of Transylvania; which is also divided from Walachia by a branch running south-west and north-east. The whole circuit may be about 500 miles. Dr. Townson (see his Travels in Hungary, 4to. 1760), visited these Hungarian Alps from the vicinity of Kefmark, and proceeding to the "Green Sea," in a lake amidst the mountains, passing through forests of firs and pines, in his progress by the thick branches of a tree resembling the pine, called "Krumholz," which were succeeded by rocks of limestone and granite. He computes that the Kefmark peak, which towards Hungary is a perpendicular rock, may be about 8508 feet above the level of the sea. The Lomitz peak, to which he next proceeded, is, as he says, the highest of the whole Carpathian-chain, and placed towards its centre; but he afterwards expresses a doubt, whether it be not rivaled, if not excelled, by the Krivan, situated more towards the west, 20° 45′ of E. long. from London. He attained
attained the summit of Lomnitz with some difficulty, and
computed it to be 8740 feet above the level of the sea, or
not much below half the height of M. Blanc, or M. Rofs.
He found it composed of grey granite like the rocks at the
bottom; but with a small mixture of a greenish black, earthy
substance; nevertheless, the vegetation consisted of little
except a few lichens. Thrice peaks are items visited except
by the hunters of the chamois, and some idle adventurers,
who search for gold and precious stones. The marmot also
appeared; but our intelligent traveller denies that the inhe-
ter, or rock goat of the Swiss Alps, is found in the Carpathian
heights. The Kreian he afterwards ascended with more
care; but found it inferior in height to the Lomnitz, being
8414 feet above the sea. It is probable that summits of
greater elevation are in the eastern part of the chain; but
there are no glaciers nor other tokens of the eternal winter
of great altitude.

Dr. Townsend gives us a curious account of a Carpathian
o K reached," and its inhabitants. This is a small wooden
but in the midst of a wood, built in the Swedish manner;
that is, with balks, whose ends are let into one another,
something in the manner of what carpenters call dove-tail
work; it was only about six yards long, and three broad;
and divided into two apartments, but by no means weather-
tight. In the first apartment the head-shepherd, who
is only a poor common peasant, lives, and makes the cheese;
the other is the magazine, where it is kept till it is sent to
Kesmark, which is every week. The buffoons of the dairy
are very simple: the sheep are driven home thrice a day to be
milked; and each milking is immediately made into cheese,
for they make no butter. The remnet is poured upon the
milk while it is warm, which is soon after beaten together,
and presently the head-shepherd’s gropes together with
both his hands all the curds. This buffoons appeared to be
difficult, and lasted near half an hour: the curds then form
one great mas, and are taken out together, put into a
cloth, and hung up; but no pressure is used. The whey
which remains is boiled, and acquires some consistence, and
this forms the food of the shepherds, and their only food
for the whole season; they have not even bread. After
the shepherd and his men had eaten their supper, the men,
of whom there are four or five, left the hut, and went to
sheep under sheds around the fold. In the night the head-
shepherd got up two or three times and hollowed to his
men, to ascertain whether they were upon the watch; and
they always answered, to satisfy him that they were atten-
tive to their duty. Great vigilance is requisite against the
wolves, and with all their precautions these animals had
carried off their flock this summer.

The Carpathian ridge occasionally branches towards the
north and south; in the former direction the most remark-
able are the hills on the west of Sileia, those which adjoin
to the salt mines of Wieliczka, a few miles south-east from
Cracow in Poland, and those which extend through part of
Buckovina. Towards the south a branch stretches from the
centre of the chain towards Tokay; and there are other branches not accurately defined, which descend in the
same direction from the eastern circuit. Pinkerton’s
Mod. Geog. vol. 1.

CARPATHIAN SEA, a part of the Mediterranean Sea, to the
south-west of the islands of Crete, and the island of
Candia. It derives its name from Carpathos, an island
which contains it partially. This sea has acquired cele-
brity from having been mentioned by Horace, Ovid, Pro-
pertius, and Juvenal.

CARPATHOS, or CARPATHUS, in Ancient Geography,
now Scarpanto, an island of the Mediterranean Sea, situat
between the isle of Crete or Candia, to the south-west,
and the isle of Rhodes, between this and the
island of Candia. It contains four towns, one of which was called Nisyros; Scolaco affixed it only three, and Potokomy one, called Poti-
dium. It was long and broad, and, according to Scolaco,
300 fathoms in length from nearly the south to the north.
Strabo says, that its circuit was 260 fathoms. This island
was anciently inhabited by some soldiers of Minos, the first
of the Greeks who possessed the empire of the sea. Many
generations after his time, Joces, the son of Demoleon,
an Argian, planted here a colony. Homer calls it Cre-
pathos. It was also called Tetrapolis, from its four towns,
Hiptapolis, from its seven towns, and Pallene, after the
son of Tan, the first possessor of this island.

CARPATHOS, a town in the above island, which was a
metropolis.

CARPATHOS, in Geography, a town of South America, in
the country of Paria, and jurisdiction of Guamales; most
of the inhabitants are weavers, and employed in manufac-
turing bays, langes, and other stuffs.

CARPE in Mex, in Botany, the name by which the
common wreath, labra torres, is known in some of the mari-
times parts of France; called also laurel noble.

CARPella, in Ancient Geography, a promontory of Alpes,
placed by Ptolem. in Carpathia, near to the promon-
tory Armoum in the Parian gulf, and S.W. of it.

CARPENTANOS Monte, in Geography, a chain of
Spanish mountains, extending from near Samna on the N.E.
and pursuig a S.W. direction towards Portugal. This
chain is also called that of Urima, or Guarama.

CARPENTARIA, a large bay on the northern coast
of New Holland, discovered in the year 1618. S. lat. 15' 20'.
E. long. 138° 50'.

CARPENTER, an artificer, whose buisness is to cut
fashion, and join timber and other wood for the purposes
of building. The word is formed from the French charpentier,
which signifies the name, formed of charpent, which denotes
timber; or rather from the Latin carpentarius, a maker of
carpenta, or carriages.

CARPENTER, in Ornithology, a name given in St. De-
mingo to a species of wood-pecker, probably the green wood-
pecker, or picus viridis, which it resembles in its colour, form,
note, and habits; because it hollows and injures trees, par-
ticularly the plum trees, which it sometimes bores through,
and the cocoa-tree. The inhabitants of Cayenne give the
name "Yellow Carpenter" to the yellow wood-pecker, the
picus caudatus of Gmelin, the picus Cayennensis albus of Bril-
ton, and picus flaviceps of Latham.

CARPENTER’S WORK, in Architecture, includes the framing,
flooring, roofing; the foundation, carcase, doors, windows,
&c. In the manufature of this kind of work, large and
plain articles are usually measured by the square foot or
yard, &c.; but enriched mouldings and some other articles
are often ellipted by running or linear measure, and some
things are rated by the piece. In measuring of joists, it
should be recollected, that only one of their dimensions is
the fame with that of the floor; and the other will exceed the
length of the room by the thickness of the wall, and ½ of
the same, because each end is let into the wall about ½ of its
thicknes. No deductions are made for hearths, or account
of the additional trouble and waste of materials. Partitions
are measured from wall to wall for one dimension, and from
floor to floor, as far as they extend, for the other; nor is any
deduction made for door-ways, on account of the trouble of
framing them. The measure of centering for cellars is found
by means of a string made to pass over the surface of the
arch for the breadth, and taking the length of the cellar for
the
the length; but in groin-centering, it is usual to allow double measure, on account of their extraordinary trouble.

In roofing, the length of the house in the inside, together with \( \frac{3}{4} \) of the thickness of one gable, is to be considered as the length; and the breadth is equal to double the length of a string which is stretched from the ridge down the rafters, and along the eaves board, till it meets with the top of the wall. For flat-cases, take the breadth of the field, by making a line ply off over them, from the top to the bottom, and multiply the length of this line by the length of a field for the whole area. By the length of a field is meant the length of the whole, and the return at the two ends; and by the breadth is to be understood the girt of its two upper surfaces, or the tread and pitch. For the balustrade, take the whole length of the upper part of the hand rail, and girt over its end till it meets the top of the newel-post, for the length; and twice the length of the baluster upon the landing, with the girt of the hand-rail, for the breadth. For waistbalustrade, take the compass of the room for the length; and the height from the floor to the ceiling, making the string ply close into all the moldings, for the breadth. Out of this must be made deductions for windows, doors, chimneys, &c.; but workmanship is counted for the whole, on account of the extraordinary trouble. For doors, it is usual to allow for their thick-keifs, by adding it to both the dimensions of length and breadth, and then multiply them together for the area. If the door be paneled on both sides, take double its measure for the workmanship; but if one side only be paneled, take the area and half for the workmanship. For the surrounding architectura, girt it about the outermost part for its length; and measure over it, as far as it can be seen when the door is open, for the breadth. Window shutters, jalousies, &c. are measured in the same manner. In the measuring by roofing for workmanship alone, all holes for chimney-flasts and skylights are generally deducted. But in measuring for work and materials, they commonly measure in all skylights, lumbin-lights, and holes for the chimney-flasts, on account of their trouble and waste of materials. Artificers measure flooring, partitioning, roofing, tiling, &c. by the square of 100 feet. See Measure and Carpentry.

Carpenters, Company of. See Company.

Carpenter's Joint rule. See Rule.

Carpenter, Ship, a person employed in the docks, in the construction and repairing of vessels.

Carpenter of a ship, is an officer at sea, whose business is to have things in readiness for keeping the vessels in repair; and to attend the flapping of leaks, filling of masts or yards, also caulking, careening, barming, and the like. He is to watch the timber of the vessel that it do not rot, consult frequently with other officers on the state of the masts, yards, &c. and in time of battle he is to have plugs, tumpions, and planks ready, for repairing breaches made by the enemy's cannon.

The carpenter has a mate under him, and a crew or gang to command on necessary occasions.

Carpentoracte Minorum, in Ancient Geography, now Carpentrax, a town of Gallia Narbonensis, N.E. of Avenio, seated upon an eminence near the river Auvson. It was known to Pliny, who reckoned it among the Latin cities; and the Romans fixed in it a colony, probably in the time of Julius Cesar. It belonged to the Memnicians, and had a triumphal arch, which is supposed to have been erected in commemoration of the victory obtained by Cn. Domitius Aenobarbus over the Allobroges and Auvernates, near the confluence of the Sorgue and the Rhone, about 21 leagues from this city.

Carpentras, in Geography, an ancient town of Vol. VI.
Carpentry.

forauceing; they had wooden cornices, and the stone seats of theatres were covered with boarding. Vitruvius, I. 4. 1. 7. &c. We alread learned of considerable buildings, as amphitheatres, containing tenons of wood; such was that built by Augustus to exhibit the shows on account of the victory of Actium, and many others, at Rome and different parts of Italy. It may be remarked that the beams of the roof were generally left uncovered by a ceiling; and sometimes, in magnificent buildings, enclosed with bronze, and even gilded as in the basilica of St. Peter, erected by Constantine.

In the colder countries of Europe, wood was more plentifully used, particularly in the interior works; and in the middle ages the art of carpentry partook of the bold and florid construction exhibited in that style of building commonly called Gothic; of this the highest pitched weighty roofs and lofty spires of the great cathedrals afford many striking instances.

In more modern times carpentry still improved. The wooden bridges of Palladio are examples of admirable construction. Some French artists also have given eminent instances of ingenious carpentry, as Philibert Dehorne in his method of constructing wooden domes; and Moutonau in his, which was executed at the Halle du Bled, at Paris, and various other works for large halls erected by Perronet, Hupseau, &c. In England the timber work of the dome and scaffolding of St. Paul's, and, in later times, many examples of centres, bridges and roofs may be cited as models of scientific carpentry; while in accuracy of execution, cleverity and neatness of finishing, our workmen are unequalled. In the north of Europe, and particularly in Sweden and Norway, wood is almost the only material used for building; and of course the natives must have considerable practical skill in carpentry.

The art of employing timber in building is divided into two grand branches: carpentry and joinery. The first includes the larger and rougher kinds of work, and that part which is material to the construction and stability of an edifice; and, generally, all the work wherein the timber is used by the cubical foot. Joinery, which is called by the French menuiserie, from the mens hois, or small wood employed in that art, includes all the interior finishing and ornamental wood-work, and is valued by the superficial foot.

In this article we shall treat of the constructive part, or carpentry, strictly speaking, leaving what respects the material and belongs to architecture in general, as the choice of trees, the strength of timber, &c. to the article Timber. We shall therefore suppose the material arrived in the carpenter's yard, and in the flate of whole or squared timber. The operations it undergoes from this period to its final employment in a building may be classified under two general heads, those which relate to individual pieces, and those which relate to their connexion with others. Under the first head are the operations of the pit saw, too generally known to need description, by which the whole timber is divided and reduced to the required scantlings; this term, from the French, ebantillon, means dimensions, relative to breadth and thicknesses without respecting length:—Planing, which is giving a smooth face to wood by means of a familiar instrument called a plane, confining of a chisel fixed in a frame, serving as a handle, by which the workman moves it along over the surface of the timber, shaving off its inequalities: timber thus prepared is said to be wrought:—Mouldings of various forms, and performed with particular planes or chisels:—Rebating, which consists in diminishing the width of a square, or rectangular piece of timber, for a certain depth on one edge, thus taking off a rectangle of the whole width, and less than the depth of the original piece; this method is particularly used in doors, cases, and the frames of casement windows, the rebate forming a kind of ledge for the door or casement to stop against:—Grooving or plowing, in which a narrow channel is excavated out of the thickness of the timber: the groove is either square, forming an equal section in the whole depth, or wider at the bottom than at the top, which is called a dovetail groove. Timber may also be beaked where the piece is formed like a wedge, or rounded; or bevelled in various shapes, which means when the section forms a figure without right angles.

We now come to the second and most important head of the operations by which timbers are connected together. These are generally speaking, by mortice and tenon, the first an excavation, and the second a projection, adapted to it; or by wooden pins or nails, spikes, ferrules, bolts, clamps, and other fastenings of metal, or by glue, though this last is scarcely used except in joinery.

The following is a description of the most general and useful methods of joining timbers. First, by simple tenon and mortise, as when joists are framed into trimmers, the most usual method is to make the tenons in the middle of the breadth of the trimmer with a plain shoulder; see fig. 1. Plate LXII. of Architecture, which represents a section of the trimmer, and a part of the joist, framed in a longitudinal direction. But when binding-joists are framed into girders, as the binding-joist has to support the bridging-joists, and these the floor, the belt method, in order to give strength to the tenon, is to make a rest of a short length under the tenon, with a sloping shoulder above, extending in a line from the extremity of the rest to the perpendicular of the square shoulder below at the upper edge of the binding-joist. See fig. 2. Plate LXII. of Architecture. No. 1. represents a section of the girders through the mortises; Nos. 2 and 3 part of the joists in a longitudinal direction.

When a piece of timber is to be framed between two parallel pieces which are quite inmoveable, the true method, in order to make close work, is to make the extremity of the tenon and the bottom of the mortise at one end, in the arch of a circle, having its centre in one edge of the mortise, and the extremity of the tenon, and the bottom of the mortise at the other end, in a concentric arch from the same centre. As the mortise at this end must be much longer than the breadth of the tenon, there will be a large part of the mortise still open, which may afterwards be filled up. Instead of the bottom of the mortise here being formed in the arch of a circle, it may be cut quite parallel to the edge to the deepest part, as it will not impede the transverse piece in going to its place. This mode of framing is much used in ceiling, joisting for double floors: the long mortises cut in this manner are called chase mortises. In forming the tenon and mortise, at the end where the centre is placed, it is not necessary that the mortise and tenon should be so deep as to form an entire quadrant; in this case the bottom may be quite parallel, and only the further edge opposite the centre made circular. Fig. 3. Plate LXII. of Architecture represents a piece of framing, in the manner above described, A B, the bottom of the mortise, and the extremity of the tenon described from the centre C; D E the running, or chased mortise, which must be quite free from the circumference described by the point D, whether the extremity be in the circumference, or in a tangent, D F, parallel to G E.

The manner of representing the tenon and mortise at the end, when the centre is placed, when the mortise is made of a leaf depth than the breadth of the tenon, is shown at the other end.

When a transverse piece is to be framed between two parallel
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valiet joists, of which their vertical surfaces are oblique to each other, the upper edge of the transverse piece is turned downwards upon the top of the joists, and marked at the interval or clear; it is then turned upwards into the position in which it is to be placed, the mark at one end is brought into a right line with the vertical surface of the joist, and a line is drawn by the edge of a rule or flat edge placed vertically in the plane of the joist and the transverse piece; this line marks the shoulder of the tenon. The other end is drawn in the same manner. This mode of framing a transverse joist between two parallel joists is called by workmen tongue-in-joists. The manner of tonguing in a joist is exhibited at fig. 4. Plate LXI. of Architecture. A and B are sections of the parallel joists. C D E F the transverse joist, or the piece tumbled in, G H the straight edge placed for drawing the shoulder C E.

A piece of timber may be joined at right angles to another in the manner of fig. 3. Plate 1.XI. of Architecture, which is a longitudinal section in the direction of the fibres of both pieces. A mortise is cut in the one piece to the breadth of the piece, which exactly fits the perpendicular length of the tenon is cut with a dove-tail notch, so that the piece may be at right angles to the other, and a wedge or key is driven from the other edge of the tenon, which forces it quite close. One inconvenience arising from the dove-tail is, that if the timber of which it is made be not quite dry, the tenon will shrink in proportion to its breadth, and therefore the perpendicular piece will be liable to be drawn to a certain degree. To remedy this defect, instead of the edge of the tenon being cut dove-tail ways, it may be notched, as is to be seen in fig. 4. No. 1. No. 2. shows another view of the perpendicular piece with the wedge.

Another method of fixing one piece of timber perpendicular to another, is to mortise the piece forming the bafe not quite through, enlarging the edges towards the bottom, and making the tenon of the perpendicular piece to fit the upper part of the mortise. Two wedges are then fixed to the bottom of the tenon; where the perpendicular piece is driven, the wedges will be refilled by the bottom, which will split the ends of the tenon, and fill up the mortise to the breadth at the widest place. This mode of fixing one piece at right angles to another is called fox-tail wedging. By this method, so long as the wedges are kept from slipping, the one piece can never be drawn from the other, without breaking the tenon. In order to enlarge the tenon in breadth still more towards its extremity, two other smaller wedges may be put in, of which their ends do not reach quite so far as those of the other two, which, when partly driven, the small wedges will then begin to widen the end of the tenon likewise, and make it fill the mortise completely at the bottom. Fig. 5. No. 1. shows the edge of the piece on which the mortise is cut. Fox-tail wedging is chiefly used when the tenon is to be put together small, and then the wedges are frequently driven in with glue; when the pieces to be joined are large, the former method is generally practised.

The fixing beams to wall-plates is called cocking or cogging. When a beam is to connect two wall-plates, in order to bind the fides of the building together, one method is to cut the end of the beam in the form of a dove-tail, and to make a corresponding notch in the wall-plate to receive it, as is shown in fig. 6. No. 1. No. 2. is a transverse section at the neck of the dove-tail. Fig. 7. shows the same thing, with a small variation in the form of the dove-tail, fitted obliquely to the other piece. But when the timber has not been sufficiently seasoned, and when it begins to dry, the perpendicular piece may easily be drawn from the other, to a certain degree. Therefore, if the sides of the building are affected by lateral pressure, this mode of fixing the one piece to the other will not prevent the walls from coming nearer together, or expanding. The most efficient method of preventing this is shown at fig. 8. No. 1. where a small notch is cut out of the beam, and the contrary piece, viz. a double notch, cut in the wall-plate to receive it. No. 1. the beam fixed longitudinally upon a transverse section of the wall-plates; No. 2. the upper face of the wall-plate. The best method of connecting any number of poles with cross-beams is depended upon this principle. Fig. 9. No. 1. shows a transverse section of a pole with two beams longitudinally bolted to it, in the manner of coxing beams to wall-plates; No. 2. a part of one of the beams, shewing the notches. The firmer method of fixing the pullins of a roof to the rafters also depends upon the same principle. Fig. 10. No. 1. is a section of the rafter, with the pullins longitudinally drawn; No. 2. the upper edge of the rafter; No. 3. the under side of the pullin, showing the notch.

The method of joining timber laterally, by means of keys and dovetails, is ingenious, and not generally known; it will be necessary to exhibit and describe the manner of doing it. Fig. 1. Plate L.XI. of Architecture. No. 1. is a longitudinal section of two pieces joined in this manner, with the dovetail piece and the wedge or key, by means of which they are forced against the ends of the pieces to be fixed, and in order to make the one press harder to the other, the interior angle of the dovetails is greater than the exterior one, formed upon the pieces to be joined; No. 2. is a transverse view of the mortise, exhibiting the ends of the dovetails and keys. Fig. 2. is the same method, applied in joining parallel pieces not touching each other together, which is plain to inspection.

The modes in which beams are lengthened are of infinite variety; some of the most approved forms are as follow. A beam may be continued to any extension by building it in three thicknesses; see fig. 1. Plate L.X. of Architecture. It may also be done by splicing one to the end of another, called by carpenters fearung, which is of various forms, as in figures 1, 2, 3, 4, 5, 6, 7, and 8. When a beam is to be lengthened, as in fig. 2 and 3, it is very difficult to get the joints close when the pieces composing it are very large, and hence they are seldom used but for very small pieces, which may be glued together. To remedy this inconvenience in large works, as well as to make it less dependent on the bolts; and to prevent every possibility of the one being drawn away from the other, is to indent them together, called tabling, as in figures 4, 5, 6, 7, 8, and 9, and to leave a small space at the end or meeting of each table for a wedge. In the operation of joining timbers in this manner, the pieces are laid so as to bring the joint as close as possible, the wedge is then driven while another person strikes the extremity of one of the pieces with a large hammer or mallet, which will bring the joint quite close, if they have been well fitted together previously to the operation; of these two forms, figures 5, 6, and 7 ought to have the preference, as the faces of the tables are parallel to the fibres of the wood, which will make them receive any longitudinal strain with a much greater force; but as a disadvantage arises from this form, that more than half the wood is cut quite through at the two ends of the joints, it has been found necessary to fix plates of iron across them, as are shewn. However, there is less to be apprehended from the tearing of the fibres, by being driven in a direction of their length, than from the bending of the bolts. Fig. 6. is a scarce with several tablings; in this it is to be observed, that the wedges in the two extreme mortises are only effective. A wedge in the middle would tend to force the joints open, and therefore the other two should only be fixed.

4 K 2
fixed. Long shearings add to the strength; but to increase the number of tables more than two, is, it is thought, rather disadvantageous, as it shortens its fibres, and consequently makes its resilience less. Fig. 7, is an excellent method of furring in two pieces, each piece being hallowed together, as in fig. 5. It has been thought by some that tailing shearings below the section of resilience more than is necessary; and for this purpose they prefer fig. 8, with an oblique facet, where the keys are let fall into the one and half into the other; but in this mode, as a draught must be left for the keys, they will be apt to be turned round in the driving, and therefore will have the effect of keeping the pieces together. Fig. 9, is a mode of furring a beam by tailing the pieces together; Nos. 1. and 2. are the half keys; when hallowed together they have the appearance of being quite straight, as is shown in No. 6. The tables are made in the form of obtuse angles, with a ridge in the middle, depressed and raised alternately, in the form of re-entering and slanting angles; No. 3, section across the depressed part; No. 4. section across the raised part: No. 5. section of the beam when hallowed together. In all forms of furring whatever, every butt joint should be furred across with iron on both sides; this will in a great degree prevent the bolts from being bent, and will increase the longitudinal resilience at the weakest section. If a beam is to be furred and tabled as in this half mode, the utmost care ought to be taken in the workmanship, so that all the buttion-places ought to be closely fitted together.

Connected with furring is the method of joining timbers, which may either be endways, sideways, perpendicularly, or obliquely. When two pieces of timber are so joined that the common beam or joint is perpendicular to the fibres of both pieces, then the joint is said to be buttting, and is called by workmen a buttin or heading joint. When two pieces of timber are joined together, so that the common beam is parallel to the fibres of both pieces, this then may be called lateral or longitudinal joining, and the joint may be called a longitudinal joint, as it runs in the direction of the grain; and when the fibres and beam of the one piece run perpendicular to the fibres of the other, this mode of joining timbers may then be called transverse joining, and the joint may be called a transverse or perpendicular joint. Lastly, when the fibres of the one piece run obliquely to those of the other, this is called oblique joining, and the joint is called an oblique joint.

Butting joints for many purposes are preferable to shearings, particularly in small work, such as the hand-rails of stairs.

They are fixed together with bolts, having a ferewed nut at each end, the head of one of these nuts must be quite round and the other square; the round one must be cut in its circumference full of notches. After having let in the bolt perpendicularly to the joint in both pieces, the nuts are sunk from one side across the grain, until the ends of the bolt may be able to pass the interior screw made on purpose to receive the exterior one; the square nut is first put in and the one end of the bolt is firmly driven into the bore made on purpose to receive it, and ferewed to the nut. The other notched nut is then put in, and the bolt in its place; the one piece may be turned round upon the other until the joint is close, but in order to secure the joint from turning round, two dowels may be inserted on each side of the bolt. Drive the one piece as close to the other as the nut will permit. Then by means of a narrow pointed screw-driver and mallet, the nut may be turned round until the joint is quite close.

Fig. 3, Plate LXII. of Architecture represents the meeting of a pair of rafters and the king post, together with the manner of furring them. This need of forming a junction by making the rafters meet each other, without the intervention of the joint, which is generally made to the king-post, has the advantage over the common mode, with a joggle-head, exhibited in fig. 6. Plate LXII. of Architecture, as the shrinking of the king-post at the joggle will allow the roof to deflex, and consequently put it out of shape.

One method of furring the tie-beam to the king-post is exhibited at fig. 7. Plate LXII. of Architecture. The mortise of the flaps on both sides is made obliquely, and that through the king-post is made somewhat lower, in order to give the wedges a proper draught. An idea may be formed by examining Nos. 1. which represents the bottom of the king-post with part of the tie-beam; Nos. 2. is a longitudinal section of the king-post, with a transverse section of the beam, in the upper part of this is shewn the manner of fixing the wedges, with the form of the washers, which are necessary in preventing the furring on each side from penetrating into the wood, the whole force of the friction being taken away from the flaps by them. Another mode of fixing the tie-beam to the king-post is by a bolt, as exhibited at fig. 8. Plate LXII. of Architecture. No. 1. shews the elevation of the bottom of the king-post; Nos. 2. is a vertical section cutting the beam transversely; in order to give greater security, there are two nuts, one let in from the face of the beam and the other from the edge. Fig. 1. Plate LXIII. of Architecture shews the meeting of a brace and framing-piece under a truss beam, as the brace may be formed into two forces, one pushing in a direction of the beam, that is, compressing the framing-piece, and the other tending to break it transversely, the end of the brace is cut in the form of a sally, or bird's mouth, as it is called by workmen. Another method is shewn at fig. 2. Plate LXIII. of Architecture. This mode is used in the roof of Greenwich chapel. See the figures in the article Roof. It may, however, be observed, that this abutment is not of the best kind; the space left for the brace to give prevalence to the framing-piece is much too small; the upper part should not be let into the framing or truss-beam, this prevents the framing piece from acting with its full force, and weakens the truss-beam.

Fig. 3, Plate LXIII. of Architecture shews the method of securing a collar-beam, at one extremity, to its adjacent rafter, in order to prevent its being pulled away at the joint, a bolt is made to pass through the rafter at the angle of their meeting.

Besides what has already been shewn of the varying of king-posts to their principal rafters, fig. 4. Plate LXII. of Architecture is another. The rafters meet each other as in fig. 5. Plate LXII. of Architecture, but instead of the forked flap, a bolt is here used, with a spreading head, so as to form a shoulder at right angles to the rafters, which are notched, in order to receive the bolt. This also prevents the rafters of a roof from sinking in the middle. Instead of any part being of wood, the whole may be of iron, confining of two parts, connected together by means of a screw, which will draw the tie-beam higher and higher at pleasure as it is turned round. Nos. 1. part of the king-post with the bolt; Nos. 2. and 3. part of the rafters; No. 4. view of the upper edge of the rafters. Various forms are sometimes adopted for the abutments at the bottom of the king-post; for the braces, when the king-post is not sufficiently broad at the bottom, as to allow the abutting shouder to be at right angles to the length of the brace, and to its whole breadth. Two of the most approved forms are exhibited in figures 5 and 6. Plate LXII. of Architecture. Fig. 5. shews the form of the abutment, when the part which makes the resilience
in the direction of the king-post is at right angles to it.

Fig. 6 shows the form of the abutment, when the part of the
shoulders which makes the defline is at right angles to the
brace; this mode is better than the former, because it is less
liable to compress the king-post at the bottom.

Fig. 7. Plate LXIII. of Architecture represents one form of
the head of a principal rafter, with the socket cut in the end
of the tie-beam to receive it; but as the small part cut across
the fibres of the beam is too near to the extremity, and as this
part fulls the whole force of the rafters, in drawing the
beam in a direction of its length, it will be liable to be forced
away. To prevent this in some measure, a double defline is
formed, as in fig. 8. Plate LXIII. of Architecture, equally
deep into the beam; this mode gives the length of the inter-
mediate part contained between the two abutments, in addi-
tion to the end defline, which is of itself equally strong
with that represented in fig. 7. The intermediate part in
this mode being cut across the fibres, it is easily split away.
A more effectual method of forming a double defline is
shown at fig. 9. Plate LXIII. of Architecture, where the head
of the rafter and the socket is cut parallel to the fibres of
the beam; the tenon forms the second abutment, being removed
further from the extremity. No. 1, the elevation of part
of the rafter with part of the beam; No. 2, the upper edge
of the beam, showing the mortise. But the most effectual mode
of forming a defline on the head of the rafter and socket
on the extremity of the beam is that represented by fig. 10.
Plate LXIII. of Architecture, where the abutment is brought
nearer to the inner part of the head, which leaves a greater
length on the end of the beam, in order that the defline
may still be greater than what is given by the wood. A lrap
may be placed round the extremity of the rafter, and the two
ends bolted together through the beam, as is shown by this
diagram at No. 1. and 2.

Fig. 11. Plate LXIII. Architecture represents two braces of
a roof meeting an iron king-post, which is only a small
rod of iron sufficiently strong to hang up the middle of
the beam, and to receive the force of the braces by the weight
of the middle rafters. The lrap which prevents the braces
from being pushed downwards has an eye through each side,
and the bottom of the king-rod is formed with a crofs equal
in length to the thickenfs of the braces; this crofs is per-
forated in its length to receive the bolt.

The purposes for which wood is employed in modern
buildings, and particularly in those of England, are very
various. It is used to form the frame work of the roof, and in
laths or boarding, to support the covering of tiles, slates, &c.
Long pieces, called bond or chain timber, are laid in the
walls to strengthen and bind them together; other flat
pieces, called plates or wall-plates, are placed to receive the
ends of the girders, joists, and other timbers, which form
the framing of the floors, and afford them a level bed. Ties
are placed across the building to affiff in keeping the oppos-
ite walls in their situation, and counteract the lateral pref-
ure of the roof, and diagonal ties at the angles. Lintels
are laid over the apertures of doors or windows to support
the incumbent walls. The floors are framed with various
beams and joists. The rooms are divided with quarter par-
titions, being a frame work of small posts and horizontal and
diagonal pieces placed at about a foot abfiend, and defned
to be called with lath and platter on the outside. Door and
window-frames are also placed in the apertures of the walls.
In bad foundations piles are sometimes used; and sometimes
planking, and what are called sapers, pieces of timber, laid
at short intervals trasversely, beneath the foundation wall,
and extending about two feet wider: besides all the fini-
ishing wood work, such as doors, windows, wainscotting, &c.
which belongs to joinery. Carpentry is also employed to con-
struct the cenfors for arching and vauting, and frequently in
entire bridges. Colur damas, caiffons, ford-gates, and all
the methods of building in water, derive large aidance
from this art.

The general principles of measuring and valuing carpen-
ters work may be given very shortly; and to enter into ma-
nume would be fuperfluous in the present work. The timber
used for building in London, and in the greater part of
England, consists entirely of oak and fir; for the first
the growth of this country, the second imported chiefly from
Norway. That timber which is out of fight, as being co-
vefed with lath and platter or other facing at the comple-
tion of the building, which is by much the greater part, is
uft as it comes from the faw, without the operations of the
plane. Of this, part is framed as the roof, floors, parti-
tions. The quantity is meafured by the cubic foot, and either
valued as for framed; or else the quantity of timber being af-
tained, is put down as fir without labour, (for no labour)
in the valuation of which is included the original price of
the timber, with the expence of cartage, fawing, waffle,
and the profit to the carpenter; and a superficial dimension
is taken of the frame or space in which the timber was em-
ployed under the denomination of labour and mafs, to a floor
of such a kind, roof, quarter partition, &c. in which is em-
ulated the value of the workmanship, with the master's
profit. The choice between these two methods is influ-
ced by custom, and the convenience of the measurer.

The timber used in the walls, as the plates, and bond timber, is mea-
sured separately by the cubic foot, and put down under the
denomination of fir in bond; this is valued at a medium price
between fir framed, and fir without labour. As for the tim-
ber which remains apparent after the completion of the
building, it is generally worked in some manner with the
plane, and is meafured by the cubic foot, and denominated
and valued according to the workmanship; thus a dooresane
is framed, wrought, rebated, and beaded. We have men-
tioned only fir because it is infinitely more used than oak,
however the latter is meafured in the same way.

Boarding, such as weather-boarding, boarding for flates,
&c. is meafured by the superficial foot, and valued in the
bill by the square, or 100 superficial feet. Timber used in
very fmall foundations, as billts, is valued, not by the cubic
or superficial foot, but by the foot in length, called foot
run.

Having thus defcribed what is properly included under
the general head of carpentry, the reader is referred, for
more particular information, to the articles CENTRE,
Floor, and Roof; under which articles that part of con-
structive carpentry which depends on certain branches of
mechanics and geometry will be fully explained.

CARPENTUM, in Antiquity, a denomination common
to divers forts of vehicles, affording to coaches as well as
wagons, or even trains among us: sometimes on two and
sometimes on four wheels; and sometimes covered, and at
other times uncovered.

The carpentum was originally a kind of carr or vehicle
wherein the Roman ladies were carried; though in after-
times it was also used in war. The form of this carriage
may be seen on antique coins, where it is represented as a
two-wheeled carr, with an arched covering, and it was some-
times hung with curiously cloth. It was a later invention than
the heliaca, and the areces mentioned in the 12 tables, which
was a covered carriage used by sick and infirm persons.

Some derive the word carpentum a carro; others from
Carmenta, mother of Evander, by a conversion of the m into
x, carpentum for carmentum. Thus Ovid, Fab. lib. i.
"Nunc prius Anusidas matres Carpeeta velbant.
Herc quaque ab Evaduri d Wright parentem.

CARPENZANO, in Geography, a town of Naples, in the province of Calabria Cita; 10 miles S. of Cofenza.
CARPETA, in Ichthyology, a name given by Cuba, and some other writers on fishes, to the common carp, cyprinus carpio.
CARPESIA, in the Materia Medica of the Ancients, a name given to a kind of spices, or aromatic drugs, often mentioned by Aeginita and others, and made an ingredient in cordial and pharmacical medicines. This was a vegetable sublimation, being the top shoots of young twigs of an odoriferous shrub, growing in Pamphylia, and smelling very like the fines cinnamon.

As the ancients used both this drug and cumin, it is certain that had they both been the produce of the same tree, they must have known it; and this is plain they did not know, for they have no where named any such thing; but, on the contrary, they expressly said, that the carpesia was the shoots of a tall tree, which produced no fruit. Avicenna gives also this account, and adds, that it grew, in his time, on mount Lebanon, and that the part gathered for this use was certain twigs, very long, cylindrical, and but little thicker than a needle, which had a very fragrant smell.

Gen. Char. Cal. common, imbricated; outer scales larger, spreading, reflexed; inner ones equal, close, shorter. Cor. compound, equal; florets hermaphrodite in the disk, funnelf-shaped; border five-cleft, spreading; female in the circumference, tubular, five-cleft, converging. Stamina filaments five, short. Pyll. similar in both kinds of florets; germ oblong; style simple; stigma bifid. Seeds ineribly egg-shaped, naked. Recepta naked.
CARPEPIACIUM, in Ancient Geography, a mountain of Asia, in Pamphylia.
CARPESTRIERA, in Geography, a river of Italy, which runs into the sea; 9 miles E. of St. Severino.
CARPET, a fort of covering, worked either with the needle, or on a loom; to be spread on a table, trunk, an eitaire, a pagasie, or a floor.

Persian and Turkey carpets are those most prized; especially the former, for which there is a manufacture at Paris: carpets that had a hair or figg on one side only, were called by the ancients tepetes; such as had a figg on both sides, were called amphiopetas. English carpets, especially those of Axminster, (which see) and those, the manufacture of which was established in London by the late Mr. Moore, are much valued. For a further account of this manufacture, see Tapestry.

Among Jacocks, to shove the carpet, is to callop very close, or near the ground; a fault foreigners charge on English horses.

Figuratively, an affair, proposal, &c. are said to be brought on the carpet, or tapis, when they are under consideration, &c.

Carpet-knights, a denomination given to grown-men, and others, of peaceable disposition, who, on account of their birth, office, or merits to the public, or the like, arc, by the prince, raised to the dignity of knighthood.

They take the appellation carpet, because they usually receive their honours from the king's hands in the court, kneeling on a carpet. By which they are distinguished from those that were created in the camp, or field of battle, on account of their military prowess.

Carpet-knights possess a medium between those called truck, or dunghill-knights, who only purchase, or merit the honour by their wealth; and knights bachelors, who are created for their services in the war.

Carpets, in Agriculture, a term applied to a green plot or path left unploughed up in an arable field; or, in common fields, to such strips as serve for divisions.

CARPETANI, in Ancient Geography, a people of Hifpania Citerior, situate on the W. towards Lutania. Their principal towns were Complutum, Cetribia, Mantua, and Toletum. Tolemy assigns to them 18 towns.

CARPETANIA, a country of Spain, in which Pliny places the towns of Cetribia and Hippona; and where this author, and also Ptolomy, place Oebura. The mountains of Carpetanias are denominated by Pliny "Carpetana juga"; and he says that the chief town was Cetribia.

Gen. Ch. Cal. superior, four-leaved; leaflets ovate, revuned, scarious, permanent. Cor. funnel-shaped; tube long, slender, swelling near the top, hairy within; border four-cleft; lobes acute. Stam. Filaments four, very short, inserted within the tube; anthers linear, erect. Pyll. Germ. inferior; style bristle-shaped, longer than the corolla; stigma bifid. Peric. Capsule crowned with the calyx, two-celled, two-valved, many-seeded; partition opposite to the valves, splitting into two. Seeds unknown. Effort. Ch. Calyx superior, four-leaved, scarious. Corolla tubular. Capsule crowned with the calyx, two-celled, many-seeded.
Sp. C. Madragarescoides, "Leaves opposite, linear-lanceolate; flowers in a corynbous." An short shrub, with leaves like those of hyssop, and terminal flowers in a dense corynbous or rather cyme. In La Marck's figure the younger branches are leafy, the older ones naked; and one of the younger branches there represented has a single pair of opposite leaves near the top, and three sets of fix or seven in a whorl below; the other has five pair of opposite leaves, and appears rough near the bottom with the scars of the fallen whorls. Found by Comeron in the island of Madragas. Jullien observes that it has the habit of Serissa and the calyx of Petrea.
CARP, Ugo da, in Biography, flourished in 1500, and
Carpi, Girolano da, a painter of portrait and history, was born at Ferrara in 1501, and studying under Garofalo, had become the best artist among his disciples. He afterwards studied the works of Correggio, and for this purpose spent several years at Parma, Modena, and other cities of Italy, where the bell of his works are preferred. Such was his success in the imitation of this eminent master's style, that many paintings, copied by Carpi from his pictures, were taken for originals, and eagerly purchased by connoisseurs. It is reported that at the court several of the paintings of Carpi passed for the genuine productions of Correggio. He died in 1556. Pilkington.

Carpi, in Ancient Geography, a people of Valeria, according to Ammianus Marcellinus, transplanted by Diocletian into Lower Pannonia, and placed in the vicinity of the Illyr. The mountains called "Carpates," were probably the first habitations of this people, who abandoned it under the empire of Alexander.

Carpi, a town of Proconsular Africa, according to Pliny, called Carpis by Ptolemy, and placed by him one third of a degree more northerly than Carthage; to this city pertained an episcopal see, noticed in the conference at Carthage. Dr. Shaw (Travels p. 87.) supposes the spot which this town occupies to be that which "Gurbos" or "Hammam-Gurbos" now stands upon; and that the hot-bath near it is the "Aqua Calida" of Livy (l. xxx. 24.) which he places over against Carthage; informing us, that several vessels belonging to the fleet of Octavius were here shipwrecked.

Carpi, in Geography, a strong town of Italy, and capital of a principality in the duchy of Modena; taken by the French and abandoned in 1703, taken again by them in 1705, and retaken by prince Eugene in 1706; the see of a bishop, suffragan of Bologna; 7 miles N. of Modena. N. lat. 44° 45'. E. long. 11° 12'.

Carpi, a town of Italy, in the Veronese, situate on the Adige, and subject to the Venetians; famous for a victory

obtained by prince Eugene over the French in 1701. N. lat. 45° 10'. E. long. 11° 39'.

Carpi extensor radialis, longior et brevis, in Anatomy, are two muscles, which arise close to each other from the lower extremity of the os humeri: the latter having its origin from the external condyle, and the former from the outer margin of the bone, immediately above the condyle. They are closely connected together, being immediately on the radius, and pass under the extensor tendons of the thumb. Their tendons run in a groove of the inferior extremity of the radius, where they are surrounded by a barba musculi, and then separate from each other: the longer muscle being insert into the metacarpal bone of the fore finger, and the shorter into that of the middle finger.

The action of these muscles consists in drawing the back of the hand towards the outside of the fore arm, which motion is termed by anatomists, the extension of the writ.

When the radius is prone, or supine, they will bring it into the middle plane between these positions. The longer muscle may afford in bending the elbow.

Winflow, Albinius and Soemmering call these muscles "Radales externi, longior et brevis."

Carpi extensor ulnaris arises in common with some other muscles from the external condyle of the humerus, and from the upper part of the ulna. Its tendon, which commences about the middle of the forearm, is pulled down at the back of the ulna by a tendinous obliquus muced and is affixed to the metacarpal bone of the little finger. It extends the joint of the writ, and may assist in turning the hand supine. This muscle is the ulnaris externus of several anatomists.

Carpi, a flexor radialis arises in company with the pronator teres, flexor sublimis, flexor carpi ulnaris, &c. from the inner condyle of the humerus. It passes obliquely across the ulna, and forms a tendon towards the writ, which penetrating a canal on the os navicular is fixed to the metacarpal bone of the index. It moves the palm of the hand towards the front of the radius and ulna, or in anatomical terms bends the writ. It turns the radius into the prone position. Winflow, Albinius, &c. call this muscle "radialis internus."

Carpi flexor ulnaris arises by a common origin with the neighbouring muscles from the external condyle of humerus, and also from the margin of the ulna. It passes over this bone, receiving fibers all the way to the writ. Its tendon is inserted into the os pisiforme of the carpus. It bends the writ. It is called by many anatomists "ulnaris internus."

This muscle concurs with the extensor carpi ulnaris in producing a lateral motion of the writ, in which the ulnar side of the hand is moved towards the ulna. The extensors carpi radiales and the flexor carpi radialis draw the radial side of the hand towards the radius. When the writ is bent, or extended without any inclination to either side of the forearm, the effect is produced by the combined action of the radial and ulnar flexors or extensors.

Carpi, in Ancient Geography, a people of European Sarmatia, who, according to Ptolemy, inhabited the district between the Poenic and the Balleri.

Carpiignana, in Geography, a town of Italy, in the Novarese; 12 miles N.W. of Novara. Alfo, a town of Naples, in the province of Otranto; 7 miles N.W. of Otranto.


Scales
As the twigs, whether bare, or covered with leaves, are usually of a red or brown color, so the flowers are pure white, and open in May. The leaves are large, ovate, acuminate, doubly toothed, with serrate margins, pubescent, villous, or silky, at the base. Male catkins are long, pendulous, sessile, or pedunculate, branched, and contain numerous stamens. Female flowers are solitary, with a single ovule. The fruit is a drupe, containing a single seed. The wood is durable, hard, and valued for its beauty and strength. It is used in shipbuilding and for the construction of bridges and other structures.
CAR

common with the heaths, and which honf Evelyn, attentive only to beautiful ell-er, reluctantly calls an infinitum, makes it eminently proper for the left mentioned pofture. Our venerable dendrologift speaks of capture of the elliptic hedge in the Luxembourg garden at Paris, and of the crede walk at Hampton-court; and while the passion for architectural gardening prevailed, the hornbeam was prof-

CARPIS, in Ancient Geography, a city in Pamonia, placed by Ptolemy near the Danube — Alfo, a river, which ran into the Rhine, on the northern bank. See also CARPI.

CARPOBALSAM, or CARPOBALSAMUM, the fruit of the tree which yields the true oriental balsam, or balsam very much resembling, both in figure, size, and colour, that of turpentine. The word comes from CARPO, fruit; and BALSAM, balsam. The carposambum is an oblong fruit with a short foot-stalk, a brown wrinkled rind, marked with four ribs; of a grateful taste and smell. See BALSAM.

CARPOBOLUS, in Botany. See Lycopersicum carpobolus.

CARPOCRATIANS, in Ecclesiastical History, a branch of the ancient Gnostics, so called from Carpos, a fruit, or the second century, adopted and taught philosophical tenets, which agree, in general, with those of the Egyptian Gnostics. He was born at Alexandria, and flourished about the middle of the second century. He acknowledged the existence of one God, eternal and incomprehensible, who made angels and powers of different orders, and to some of them he ascribes the formation of this lower and visible world. He taught that Jesus was the son of Joseph and Mary, according to the common course of nature; that he was endowed with a most pure soul of great capacity and understanding, and that he retained the remembrance of the things which he had seen with the father, in his pre-existent state, which he revealed to men; that he wrought miracles, and excelled in the holiness of his life, and in all virtue; that he lived among the Jews, and suffered death; after which his soul ascended to heaven and returned to God. He also inculcated the pre-existence of human souls; and expected the salvation of the soul only, and not the resurrection of the body. Some have accused, that his doctrine, with regard to practice, was in the highest degree licentious. Accordingly, he is charged with not only allowing his disciples to sin, but recommending to them a vicious course of life, as a matter of obligation and necessity; and with affenting, that eternal salvation was attainable only by those who had committed all sorts of crimes, and had daringly filled up the measure of their iniquity. It is also said, that, though he acknowledged the laws which Christ enjoined on his disciples, he held that lusts and passions, being implanted in our nature by God himself, were not criminal and culpable; that all actions were indifferent in their own nature, and were rendered good or evil only by the opinions of men, or by the laws of the state; that it was the will of God, that all things should be possible in common, the female sex not excepted; but that human laws, by an arbitrary tyranny, branded those as robbers and adulterers, who only used their natural rights. It has been said also, on the authority of some ancient writers, that the Carpoctiians marked their disciples on the back past of one of their ears; that they had pictures and images of Christ and his apostles, and of some heathen philosophers and poets; and that they honoured them with superfluous rites. They are charged also, not only with maintaining the community of women, but with allowing lewd and lascivious practices at their fuppers, or love-feasts; and they were chargeable with unnatural uncleanness, as well as magic. Dr. Lardner, with his usual impartiality and candour, examines the ground of these charges, and inclines to think that the immoral principles and immoral practices ascribed to them are not proved, and that the charges are owing to mistake or prejudice, or both. There might, he says, be loose and wicked

CARPIONE, in Botany, a name given by some old writers to the fifth called in England the cherb. See Salmo-

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men among the Carpathians, as there were in other sects; but that they were countenanced either by Carpathocrites, or by his son Epiphanius, who taught the same opinions with his father, and had many followers, though he died at the age of 18 years, or by the principles they taught, does not appear to him to be probable. Epiphanius says, that they rejected the Old Testament; but Dr. Lardner conjectures that possibly the fact only was this: that they did not accept the infusions of Moses and the prophets equally with those of Christ and his apostles. He apprehends also, that they received all the books of the New Testament, as they were received by other Christians in their time. Motham, Eccl. Hist. vol. ii. p. 227, 5c. Lardner's Works, vol. ix. B. ii. ch. 3 p. 328—310.

CARPODETUS, in Botany, (from mappa, fruit, and 3e, to kind,) the fruit being surounded or bound by a ring or fillet,) Schreiber, gen. 362. Mart. Willd. 410. Forl. gen. 17, Chis and order, pentadaria monogyna. Nat. Ord. Khamnii, Juff.


Ell. Ch. Corolla pentapetalous, inserted into the margin of the calyx. Berry inferior, dry, five-celled, annulated.


CARPOLOGY is that part of Botany which treats of the fruit of plants in the most extensive sense of the word, describes its various appearances, divides it into distinct kinds, analyses it into its several parts, and forms the whole into a regular system. See Fruit.

CARPUDEMUM, in Ancient Geography, a town placed by Ptolemy in the interior of Thrace. See SKELETON.

CARPUS, in Antiquity, is the term applied to the whet.

See SKELETON.

CARPUTH, in Geography, a town and fortresses of Asiatic Turkey, in the province of Aladalia; 12 miles from Arzengun.

CARPZOVIANUS, in Biblical History, is the denomination of a MS. of the four gospels, marked 78 in the first part of Wetstein's New Testament, which Küster, judging from the letter, supposed to be 600 years old. Gottlob Carpzzow of Leippich had it in his possession, and Küster procured from Dr. Boerncr thosc extracts, which he inserted in Mill's edition of the Greek Testament.

CARPZOVIES, BENEDEIT, in Biography, was born in 1595, and succeeded his father, who was an eminent lawyer, as counsellor to the elector of Saxony, and adviser of the judges of appeals. His acquaintance with the jurisprudence and legal practice of Germany was very extensive; and by availing himself of an indulgent research in the constitution and decisions preferred in the various archives of the country, he was the best writer on these subjects. Of his numerous works the principal arc as follow, &c. "Practica rerum criminalibus," fol. published in 1615, and several times reprinted and abridged; "Definitiones forenses, vel jurisprudentia forensis Romano-Saxonica ad constitutiones electoria Augsbg," 1638, fol.; A commentary "Ad legem regiam Germanorum," 1640; "Repentina juris electoria," fol. 1642; "Definitionum ecclesiasticarum feu confessorialium," &c. 1649; "Decisiones Saxonicarum," 3 vols. 1646—52—54; and "Procesquis Juris Saxonicarum," fil. 1657. The close of his life at Leipzig was devoted altogether to the study of the scriptures, which he had read over, as it is said, 53 times, besides commentaries. He died in 1666. Several others of the same family and name distinguished themselves as theologians and philologists.

CARR, in Ancient Geography, is a fort of cart made use of in some districts for conveying light weights. There is an improved kind of cart, which is much employed in Leicestershire, for conveying dung and other similar matters upon land in an easy and expeditious manner, as a good horse is capable of drawing near a ton weight in it. It is constructed in the following manner. The diameter of the wheels is four feet; the length of the body the same; the width of the body three feet ten inches; the height of the shafts ten feet. Rails are capable of being occasionally put on for the purpose of carrying turnips, or other roots of a similar kind. It is made by Mr. Handford, of Hathern; and carts when complete, 6f. 152. 6d. and, with an iron axle-tree, 6f. 16s. 6d. This fort of carriage was found very useful for various purposes on Mr. Bakewell's farm. And the improved Irish Carr is another useful fort of carriage of this kind, which was much recommended by the same intelligent farmer. It is observed, in the second volume of communications to the Board of Agriculture, that "its principal advantages consist in the facility with which it is loaded, from its own axle; and where gateways and roads are narrow, much room being gained by having the wheels under the body of the cart. In such situations, this cart seems well calculated for carrying manure, especially on meadow or ploughed ground; and for that purpose its wheels ought to have a flat bearing, and be at least six inches in breadth. Another advantage of this cart is, that from its construction the wheels are necessarily cylindrical, at least they are not necessarily conical; and the facility of draught arising from this unobserved circumstance has probably been imputed to some other part of the construction, as we find by experiment, that the resistance to the cylindrical wheel is not increased, but diminished by increasing the breadth, and the flat bearing of its rim. The knowledge of this fact is of very great importance to the farmer, as well as to the waggoner, since by this means, he may be enabled, in almost all situations, to drive his broad-wheeled carts, &c. on his meadow or ploughed grounds when no narrow wheel can be used; the advantages of which are too well known to be here insinuated on: but when the width of gate-ways, and the breadth of roads, will admit of the wheels being placed at the sides of the cart, without confining the width of its body, it will probably be more advantageous to have them sideways than under the cart." A cart of this nature is represented at fig. 2. Plate III. of Agriculture.

CARR, carrum, in the Middle Age, denoted any fort of vehicle, or carriage, either by land or sea.

CARR, Carus, a kind of rolling throne, used in Triumphs, and at the splendid entries of princes.

The word is from the ancient Gaulish, or Celtic, carr; mentioned by Caesar, in his Commentaries, under the name carus. Plutarch relates, that Camillus having entered Rome in triumph mounted on a carr drawn by four white horses, it was looked on as too haughty an innovation.

Carr is also used for a kind of light or open chariot. Pontanus observes, that Erichthonius was the first that harnessed horses, and joined them in a carr or chariot. The carr, on medals, drawn either by horses, lions, or elephants, usually signifies, either a triumph, or an apotheosis: sometimes a procession of the images of the gods, at a solemn supplication;
supplication; and sometimes of those of some illustrious families at a funeral—the car covered, and drawn by males, only signifies a consecration, and the honour done any one of having his image carried at the games of the event.

See Consecration.

The car used by the ladies was called pilentum, carpentum, and buffeta. See Coach.

Carr, in Geography, a small plantation in the county of Lincoln and district of Maine, North America.

CARRA, a river of the county of Kerry, Ireland, which rises in Magillicuddy's reeks, W. of the lake of Killarney, and after a rocky course of a few miles flows into a lake of the same name, from which its waters are emptied into the bay of Coillmar. On, or very near the banks of this river was the village of Blackstones, a romantic spot where Sir W. Petty erected iron works, which continued as long as the timber on the neighbouring mountains supplied wood for charcoal; but when this was exhausted, from neglect of coping, the works ceased, and the village has gone to decay. Smith's Kerry.

CARRAC, or Carraca, a name given by the Portuguese to the vessels they send to Brasil and the East Indies; being very large, round built, and fitted for fight as well as burden. Their capacity lies in their depth, which is very extraordinary. They are narrower above than underneath, and have sometimes seven or eight floors; they carry about 2000 tons, and are capable of lodging 2000 men; but of late they are little used. Formerly they were also in use among the knights of Rhodes, as well as among the Genoese, and other Italians.

It is a custom among the Portuguese, when the carrao returns from India, not to bring any boat or flot to the service of the ship, beyond the island of S. Helena; at which place they sink them on purpose, in order to take from the crew all hopes or possibility of saving themselves, in case of shipwreck.

In the year 1592, a Portuguese carrack was captured by Sir John Barrow which is thus described. "This carrack was in burthen no less than 1600 tons, whereof 900 were merchandise: the carried 32 pieces of brass ordnance, and between six and seven hundred passengers; was built with decks, seven flory, one main alope, three clofe decks, one fore-castle, and a spare deck, of two floors apace. According to the observations of Mr. Robert Adams, an excellent stonometrian, he was in length from the beakhead to the stern 165 feet; in breadth near 47 feet; the length of her keel 100 feet; of the main-mast 121 feet; its circuit at the partners near 11 feet; and her main-yard 100 feet;"

CARRACA, in Ancient Geography, a town of Italy, in the country of the Bechini according to Ptolemy; supposed to be Caravaggio.

CARRACCI. See Caracci.

CARE, in Ancient Geography, a town of Asia, in Syria, situated to the east of a chain of mountains, on the banks of a small river, S. W. of Gaetara, and at some distance to the east of Heliopolis.

CARRAGHLOUGH, a very pretty lake of the county of Mayo, Ireland, 5 miles long and 3/2 broad, with wooded peninsulas and islands. In the surrounding barony which is called from it, and includes the town of Carrickbar, the linen manufacture is carried on in a manner superior in neatness to most parts of the country.

CARRAGHRTHOM Mountains, mountains in the western extremity of the county of Tyrone adjoining the county of Down, and North of Lough Derg. Beaufort.

CARRAGO, in Antiquity, a kind of fortification, or de-
CARRÉ, Michael, the younger brother of the former, was born at Amsterdam in 1660, and having commenced the study of his art under his brother, accomplished himself in his profession as the disciple of Nicholas Berchem; he afterwards preferred the style of Vander Ieew to that of Berchem. He resided several years in London, without obtaining much employment or reputation. After his return to his native city, he was invited to the Prussian court and liberally recompensed for his works as an artist. His taste led him to embellish grand palaces, halls, and large apartments; and in works of this kind he was fond of introducing subjects that excited terror; such as storms with lightning, the destruction of castles and towers, and the tearing up of trees by the roots. In his cabinet pictures he had a ready hand, and a neat manner of pencilling. Pilkington.

CARRÉA Poldemia, in Ancient Geography, a town of Italy, in Liguria, N. of Augula Vagiennorum, celebrated for its black wool.

CARRÉ, a people who, according to Pliny, inhabited the interior of Arabia Felix, and to whom he assigns the town of Caritha, called by Ptolemy Carithara.

CARREL, in Antiquity, a cloist or apartment for privacy and retirement. This term, which has been long diffused, was principally applied during what are called the middle ages to the closets for study which were usually given to each monk in the cloister of his monastery. In the visitations of the old religious houses the prior or superior is frequently enjoined to visit these carrels, or cells, once or twice a year. (See Covel's Law Interpreter, v. CAROLA.)

CARRE, in Ancient Geography, a very ancient city of Afa in Meopotamia, near the Euphrates, at the distance of eighty miles from Hierapolis. It was famous for the defeat of the Romans by the Parthians, and the death of Crassus, the Roman general, and also for a temple of the moon. M. D'Anville places it to the west of a small chain of mountains, which separated it from Chaboras. See Haran.

CARRI, in Geography, a town of Italy, in the province of Piedmont; eight miles N.N.W. of Ceva.

CARRIAGE, a vehicle for the conveyance of persons, goods, &c. from place to place.

CARRIAGE Artillery, in French affuts des canons, are wooden frames or machines, on which cannons are mounted and transported from one place to another. They are of various kinds.

Garrison-gun-carriages are those, on which garrison-guns are commonly mounted. Such a carriage with its gun on it moves on four cast-iron trucks or small low wheels seldom exceeding twenty-four inches in diameter.

A Ship-gun-carriage differs from a garrison-gun-carriage only in having its trucks of wood, and breach-rings, which the other has not.

There are copper clouts underneath the axle-trees of garrison-carriages to diminish the friction of the iron on the wood.

Travelling-carriages and field carriages are such as guns are mounted and transported on when employed at sieges or on service in the field. They are much longer than garrison or ship-gun-carriages and are differently constructed. Every such carriage has two wheels and a long trail. And the limber for moving it with by means of the pintle-pin or iron bolt has two wheels also.

Timbers are two-wheel-carriages, made commonly each with two shafts, but sometimes with a beam or pole, for drawing double with. They support the trails of travelling or field carriages, by means of the pintle-pins or iron bolts, when the guns are to be transported, or removed from one place.
place to another. The pieces are generally fired with the
trials of their carriages taken off from the limbers—but they
may be fired with them on the same, and sometimes are
on a march when attacked, or prefled on by an enemy.

Gun-carriages, are for one and a half pounders. Such
a carriage has flats to be drawn without a limber, and is re-
garded by many artificers, as more convenient than other
field-carriages, and preferable to them. It is a carriage,
that answers very well also for a light three, or fix pounder.

Howitzer carriages, are for supporting, and transporting
howitzers. Those for the 6 and 8 inch howitzers are made
with ferews, for elevating them in the same manner as the
light fix pounder-carriages are. They are therefore made
without a bed, and the centre-tranfom is nine inches broad
for fixing the elevating ferew in, instead of four, as in tho
that are made without such a ferew. In the centre, between
the trail and centre-tranfom, there is a tranfom-bolt, which
is not in others, because the centre-tranfom must be made
to be taken out; and when it is, the howitzer may be
elevated to any degree under ninety.

Tumbrel, or Tumbrel-carriages, are carriages with two
wheels, commonly made use of for carrying the pioncers',
makers', and artificers' tools. They are also fometimes
employed for carrying the money of the army.

Block-carriage, is one that is made out of a solid block,
or piece of timber, so hollowed or cut into, as to receive the
gun or howitzer into the cap-squares: the flat, or lower part
of the cap-square is let into the solid wood, and the gun or
howitzer is elevated or depressed by means of a ferew, as on
another carriage. The limber of this carriage carries two
large chests for ammunition, and takes four men. The
pin-tile, or iron bolt of the limber, is so constructed as to
make the gudgeon of the carriage, by which means a greater
relief is obtained when the carriage passes over rough or un-
even ground. Block-carriages are chiefly made for the pur-
pofe of conveying mortars and their beds from one place to
another.

Block-carriages are also used by the horfe-artillery, as
carricules. They are very useful on service. The original
inventor of these is the ingenious General Congreve, to
whom the Board of Ordnance is indebted for many improve-
ments, and the nation for important services; which merit
attention and recompence.

Truck-carriages, are for carrying timber and other heavy
articles from one place to another, at no great distance from
it. They are also employed for moving guns and mortars,
where their own carriages cannot go, and are drawn by men
as well as horfes and other beafts of burthen.

A Ponton-carriage is solely for transporting the pontons.
Formerly it had only two wheels, but now it has generally
four.

Besides these, there are other artillery carriages, as land
and sea mortar-beds, which have no wheels, as mortars are
not transported on their carriages; powder carts; ammunition
wagons; flint wagons; travelling forges; and pontons.

Figure 1. (See Artillery-carriages in the plates) is the
outside elevation or profile of a garrifon or ship carriage;
and fig. 2 is the inside elevation of one of the checks or fide-
pieces, showing some of the irons in it, that would not otherwise
be seen; the manner in which these pieces should be
let into the axletrees, and the position of the tranfom.
The height of each fide-piece before, is equal to 43 diam-
eters of the fhot, and its height behind is only half as

The length of the fide-piece is supposed to be
bifected or divided into two equal parts, and of these two,
the hind part is supposed to be divided into four equal parts,
as a fcale for making the steps by. Each of these fide-
pieces is hollowed or cut out beneath, in the form of a cir-
cular arc, of which the radius is about half the length of
the piece. This makes it somewhat lighter without diminishing
its strength. Both the axletrees are let into the fide pieces
in the manner represented in fig. 2. The tranfom is placed
directly over the fore-axletrees, in the middle of the height
of the fide-pieces, and is one diameter of the fhot broad,
and two deep.

The following are the names of the different pieces of
iron-work in a ship and garrifon-carriage, with the number of
each. See Artillery-carriages, fig. 1 and 2.

a. The curved parts of the cap-figures. 1
b. Eye-bolts. 2

The only iron used for these purposes is wrought iron,
and made in the form of a right line. The next step is
to place the pieces in a circle, and to divide them into
equal parts. This is done by making a circle with a
compass, and then drawing lines through the center
and the points of division. The pieces are then
bent to fit the circle, and the edges are filed
smooth. The resulting shape is a series of
right triangles, which are then cut out
and assembled to form the carriage.

The carriages are then placed on the
ground and the pieces are securely
fastened together using nails or screws.

N. B. The garrifon-carriage has all
these irons as well as the ship-carriage,
except the two brecceling-bolts with rings.

The construction of these carriages is as follows. See
fig. 3. Let A B be any indefinite right line. In it take any
two points, C, D, so that the distance between them shall be
equal to three seventh parts of the gun's length, or to the
distance from the centre of the trunnions to the extremity of
the breech. Through these points draw two right lines at
right angles to A B. On the first of these, take C E, C F,
in opposite directions and each of them equal to half the
diameter of the second reinforce-ring of the gun. On the
second take also D G, D H, in opposite directions, and each
of them equal to half the diameter of the base-ring. Then
right lines drawn through the points E, G, and f, H, will
determine the inside width of the carriage.

If parallel to these two last mentioned right lines, there
be drawn two others at the distance of one caliber of the
gun from them respectively; these again will determine the
breadth of each of the side-pieces and the outside width
of the carriage. And if, from D towards B, there be set off
D I, equal to the length of the cañon, and from C towards
A, there be set off C K, equal to half the diameter
of one of the trunnions, with half the diameter of one of
the fore-trucks, I K will be the length of the carriage.
The right line E F, palles through the centre of the trunnion-holes,
the diameter of each of which is equal to a
caliber of the gun. The centre of each of these holes
is about a quarter of an inch below the upper surface of the
side-piece. Six inches are set on each side of G H, for the
axletree, which is always twelve inches broad.
Mr. Muller, in his "Treatise on Artillery," gives another
construction for gun-carriages to suit his construction of
guns. In constructing both he supposes the diameter of
the shot to be divided into 24 equal parts; and on this sup-
position, in constructing the gun-carriage, he takes CD,
(see fig. 3.) equal to six diameters of the shot, and ten parts;
CE, CF, each equal to 34 parts; DG, DH, each equal
to 39.5 parts; the breadth of each of the side-pieces equal
to one diameter, or 24 parts; DI equal to one diameter
and 12 parts; and CK equal to two diameters and a half.
He makes the breadth of the fore axle-tree equal to 30 such
parts; its length equal to six diameters and a third; the
length of each of the arms equal to 44 such parts, and the
diameter of each of them equal to 24 such parts. In the
elevation he makes the height of each of the side-pieces be-
fore, equal to four diameters and three quarters, and equal
to half that height behind. The height or depth of the
fore axle-tree he makes equal to 42 such parts; and that of
the hind axle-tree equal to 30 such parts. The bed-bolt
passes under the middle of the fourth step and is even with
the lat, or hind step.

He makes the breadth, or thickness of each of the wooden
tools equal to that of each of the side-pieces, which by
his construction is equal to one diameter of the shot, or to
24 such parts; the diameter of each of the fore-trucks equal
to four diameters of the shot, and that of each of the hind-
trucks equal to three diameters and a half. These diamc-
ters, however, must of course be increased or diminished to
suit the height of the port-holes in ships.

Of travelling, or field carriages. The long side-pieces,
PQ, RS, (see fig. 12.) are called the cheeks; the fore part,
QR, of the carriage, is called the bealt, and the hind part,
PS, the trail. T denotes the trail-trumom; X the bed-
trumom; V the centre-trumom; and Y the beatt trumom;
GH the body of the axle-tree; W the pintle-hole; and
m, n denote the tramum-holes.
The following are the dimensions of the cheeks.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>24 Pounder</th>
<th>18 Pounder</th>
<th>12 Pounder</th>
<th>6 Pounder</th>
<th>3 Pounder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lengths of the cheeks</td>
<td></td>
<td>156.0</td>
<td>150.0</td>
<td>144.0</td>
<td>132.0</td>
</tr>
<tr>
<td>Thickness of ditto</td>
<td>-</td>
<td>5.5</td>
<td>5.2</td>
<td>4.6</td>
<td>3.6</td>
</tr>
<tr>
<td>Height of the plank</td>
<td>-</td>
<td>22.0</td>
<td>21.6</td>
<td>19.0</td>
<td>16.0</td>
</tr>
<tr>
<td>Height of the cheek</td>
<td>Before</td>
<td>20.0</td>
<td>19.5</td>
<td>17.0</td>
<td>14.0</td>
</tr>
<tr>
<td></td>
<td>Centre</td>
<td>17.0</td>
<td>16.5</td>
<td>15.0</td>
<td>12.0</td>
</tr>
<tr>
<td></td>
<td>Trail</td>
<td>12.0</td>
<td>11.6</td>
<td>11.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Head from the centre</td>
<td></td>
<td>7.4</td>
<td>7.2</td>
<td>6.9</td>
<td>6.0</td>
</tr>
<tr>
<td>Length of the trail</td>
<td></td>
<td>18.0</td>
<td>16.5</td>
<td>15.0</td>
<td>12.0</td>
</tr>
</tbody>
</table>

The following are the dimensions of the axle-trees.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>24 Pounder</th>
<th>18 Pounder</th>
<th>12 Pounder</th>
<th>6 Pounder</th>
<th>3 Pounder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td></td>
<td>38.5</td>
<td>38.8</td>
<td>39.0</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>Length</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breadth</td>
<td>7.0</td>
<td>6.8</td>
<td>6.5</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>Height</td>
<td>9.0</td>
<td>8.8</td>
<td>8.5</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>Length</td>
<td>21.0</td>
<td>20.8</td>
<td>20.5</td>
<td>19.0</td>
</tr>
<tr>
<td>Arms</td>
<td></td>
<td>5.0</td>
<td>4.8</td>
<td>4.5</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>Body diameter</td>
<td>7.0</td>
<td>6.8</td>
<td>6.5</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>Linch diameter</td>
<td>5.0</td>
<td>4.8</td>
<td>4.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Total length</td>
<td></td>
<td>80.5</td>
<td>80.4</td>
<td>80.0</td>
<td>78.0</td>
</tr>
</tbody>
</table>

And the following are the dimensions of each of the wheels.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>24 Pounder</th>
<th>18 Pounder</th>
<th>12 Pounder</th>
<th>6 Pounder</th>
<th>3 Pounder</th>
</tr>
</thead>
<tbody>
<tr>
<td>The diameter of each of the wheels</td>
<td></td>
<td>58.0</td>
<td>58.0</td>
<td>58.0</td>
<td>58.0</td>
</tr>
<tr>
<td>The length of the nave</td>
<td></td>
<td>17.5</td>
<td>17.5</td>
<td>17.0</td>
<td>15.5</td>
</tr>
<tr>
<td>Diameter of ditto</td>
<td></td>
<td>16.0</td>
<td>16.0</td>
<td>16.0</td>
<td>14.0</td>
</tr>
<tr>
<td></td>
<td>Body</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Linch</td>
<td>13.5</td>
<td>13.5</td>
<td>13.5</td>
<td>10.0</td>
</tr>
<tr>
<td>Falloe, or fellies</td>
<td></td>
<td>5.0</td>
<td>5.0</td>
<td>4.5</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>Thickness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breast</td>
<td>6.5</td>
<td>6.5</td>
<td>6.0</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>Thickness</td>
<td>2.3</td>
<td>2.3</td>
<td>2.2</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Breitbart</td>
<td>4.5</td>
<td>4.5</td>
<td>4.0</td>
<td>3.5</td>
</tr>
</tbody>
</table>

The following are the names and numbers of the different irons, or pieces of iron-work in a travelling carriage.

<table>
<thead>
<tr>
<th>Irons or Pieces of Iron-work</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transform-bolts with hooks</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transform-bolts</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trunnion-plates</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cap-squares with joint-bolts</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

The names of the different irons, or pieces of iron-work in a travelling carriage.

<table>
<thead>
<tr>
<th>Irons or Pieces of Iron-work</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transform-bolts with hooks</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Transform-bolts</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Trunnion-plates</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Cap-squares with joint-bolts</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Spring</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Spring keys with chains and staples 4  
Eye-bolts 2  
Single fore-lock keys 8  
Bread-plates 2  
Bed-piece chain and staple 1  
Plates with roses 6  
Garnish 2  
Axle-tree bands 2  
Side-flaps 4  
Lockers 2  
Draught-rings with bolts and bars 1  
Locking plates 6  
Lashing-rings with loops 1  
Nails 2  
Pintle-plates 8  

The names and numbers of the parts and iron of a travelling carriage-wheel are the following.

Nave 1  
Spokes 12  
Felloes, or felloes 6  
Dowel-pins 6  
Streaks 6  
Streak-nails 48  
Nave-boxes 2  
Nave-hoops 6  
Dowel-pins 2  
Dowel-pins 24  
Dowel-pins 9  
Box-pins 6  

The dowel-pins are wooden pegs about three inches long each, and three quarters of an inch in diameter. They serve for joining or fastening the felloes together.

The dowel-pins are iron plates, which are sunk into the felloes on the outside, and are each of them fastened to the nave with four pins, or rivets. They serve to fasten the felloes strongly together, and to strengthen the joints.

The nave is almost always made of elm, cut six months before it is used, and left all that time in the bark. Larch, however, would probably be found on trial to answer full as well, if not much better. The spokes are made of elm, or young oak, and as dry and well seasoned as possible. The felloes are for the most part also of elm, but are sometimes made of split beech, which makes to the full as good, if not better ones. And the axle-tree is generally made out of dry elm, young oak, or young beech. Swamp-maple is, however, much preferable for this purpose to either elm or beech.

The checks and tranfoms are always made of dry elm. But either young oak, or swamp-maple, are preferable to it for both.

The names and the numbers of iron, or pieces of ironwork in the axle-tree of a travelling-carriage, are the following.

Axle-tree bar 6  
Clouts 2  
Axle-tree hoops 2  

<table>
<thead>
<tr>
<th>Hurtle with flaps</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washers</td>
<td>2</td>
</tr>
<tr>
<td>Latch-pins</td>
<td>2</td>
</tr>
<tr>
<td>Axle-tree bolt</td>
<td>1</td>
</tr>
<tr>
<td>Single fore-locks</td>
<td>2</td>
</tr>
<tr>
<td>Clout-nails</td>
<td>2</td>
</tr>
<tr>
<td>Dog-nails</td>
<td>8</td>
</tr>
<tr>
<td>Axle-tree hoops</td>
<td>2</td>
</tr>
</tbody>
</table>

The usual construction of travelling-carriages is the following. See fig. 1.

Let A b c d e be the planks, out of which one of the cheeks is to be made, and let A B be the height of the said cheek before. Set off from B to C the sum of the said height, or of the head, A B, and the distance from the hind part of the trunnions to the extremity of the caseable. Then, from the point, A, as a centre with the radius, A C, describe an arc, in which, as a chord, apply a right line, C D, equal to the height of the cheek at the centre, and draw the right lines, A D, B C. On B C, take B E, equal to the head, A B, or height of the cheek before, and from the point, E, set off towards the right lines, E F, G, equal each to half the diameter of one of the trunnions. Then, E F being equal to the diameter of the trunnion, cut the trunnion hole out of the cheek, so that its centre may be about a quarter of an inch below the line, B C, or E F. From the point, F, draw the right line, F P, perpendicular to A D, or parallel to A B, and in A D, take F H, equal to the breadth of the axle-tree, which is to be cut as near as in inches into the cheeks. On the right line, F H, constitute a square, and from I, the point of intersection of its diagonals, as a centre with a radius of 29 inches, which is equal to the radius of the wheel, describe an arc. This arc will represent a part of the wheel; and if a ruler touching the said arc be laid across the plank, that the distance, M L, which is equal to the length of the side, and from the points, M, L, perpendiculars, M N, L O, to M L, be also erected, equal each to the height of the wheel, the right lines, C N, N O, and D M, being drawn, will, with the right lines, A B, C G, and A D, give the figure, A B C N O P M D A, of the cheek required.

The lower part, M P, of the trunnion is round in order that the carriage may slide with more ease on the ground, or on a platform, which is round, formed by first dividing L O into four equal parts, and taking L P equal to one of them; and, secoundly, by erecting right lines at the points, M, P, perpendicular respectively to D M, M P, and meeting in the point, Q; and lastly, by bisecting M Q in the point, R, and from R, as a centre with the radius, R M, describing the arc, R M, P.

The mortise, V, of the centre-tranfom is ascertained or determined by drawing a right line through the point, C, perpendicular to the horizon, K M, in which C P is taken equal to a fourth part of the foot's diameter, and p q equal to twice that diameter for its height. Its breadth, p x, taken in a right line, p z, parallel to K M, is equal to one diameter of the foot. The distance between the centre-tranfom, V, and the bed-tranfom, X, is equal to two diameters of the foot; and the height and breadth of this last are each equal to one diameter. The bed-tranfom, Y, is one diameter of the foot broad and two high. The sides of it are parallel to the head, A B, and terminate above, or at top in a right line parallel to B E, and equally distant from it with the bottom of the trunnion-hole. And the inside of them, if produced, would pass through the point at the side of the said hole, that is next to the head, A B. The mortise of the trail-tranfom is equal in length to the trail itself; its height is equal to one diameter of the foot, and
and it is parallel to the upper side, N O, of the trail. Its lower side, if produced, would pass through the point, P.

All these distances, viz. of the breach-tranform, the bed-tranform, the centre-tranform, and the trail-tranform, are divided by horizontal right lines into four equal parts, the upper one of which is sunk or let in half an inch into each of the cheeks, the two middle ones to the depth of two thirds of the thickness of one of the cheeks, and the lower one not at all.

And the following is the construction of the plan of a travelling gun carriage. See fig. 12.

Draw any indefinite right line, A B. In it take the right line, C D, equal to the distance from the centre of the trunnions to the extremity of the base-ring of the gun. Through the points C, D, draw right lines perpendicular to A B, and let them be produced indefinitely. On that drawn through the point C, take C E, C F, contrary ways and equal each to the radius of the second reinforce-ring.

And on that drawn through the point D, take D K, D L, also contrary ways, and equal each to the radius of the base-rings. Then right lines drawn through the points F, K, and E, K, will determine or ascertain the width of the carriage within; and if two right lines be drawn parallel to these, and at a distance from them respectively equal to the length of either of the trunnions, they will give the equal thicknesses of the cheeks Q P, R S.

The positions of the trunnions holes M, N, are ascertained by setting off a distance both from the point E, and the point F, equal to half the diameter of either of the trunnions. The breach-tranform, Y, must be drawn with a breadth equal to one diameter of the shot, and with its inside in a line with the fore parts of the trunnion-holes. Take C A equal to r B in the last figure. Then a right line, R A Q, perpendicular to A B, will determine the breadth of the carriage; and its total length is ascertained by the immediately preceding figure.

If two diameters be let off from the right line K L, we shall get the hind part of the centre-tranform, V, the width or breadth of which as well as that of the bed-tranform is equal to one diameter of the shot. The distance between these is equal to two diameters, and the position and breadth of the trail-tranform are ascertained as before by the immediately preceding figure. In the middle of this tranform is the pintle-hole, of an oval form, wider above than below, in order that the pintle may have room to play in it when the carriage is moving on or going over uneven ground. The bed, w, is a piece of an inch and half-board one foot broad and is sunk or let down into the bed and centre-tranforms. The plane of the fore-part of the axle-tree would, if produced, pass through the centres of the trunnion-holes. There is a board fixed with one end on the axle-tree and the other on the bed-tranform, for laying hay, draw, &c. upon for wadding. From about one diameter and a half from the centre-tranform, to about a diameter from the trail, the breadth or thickness of each of the cheeks is diminished by a sixth part of the same.

This is the construction that has been commonly observed and made use of for travelling carriages. But Mr. Muller has given a general construction for them to suit his construction of guns, the lengths of which he supposes to be respectively equal to 20 or 21 diameters of their shot.

The general dimensions of travelling gun carriages, according to this construction, are the following. See fig. 11.

The length, A d, of the plank is equal to two feet and a half together with twelve diameters of the gun's shot. The height, A B, of each of the checks is equal to three diameters and a quarter. B b is equal to half a diameter, and the height, D C, at the centre is equal to 70 such equal parts as those, of which the said diameter contains 24.

The length of the trail is equal to three diameters, and its height, M N, is two. The breadth, F H, of the axle-tree is equal to two diameters, and the rest of the dimensions are regulated by the size of the gun.

The following is his construction of travelling carriages for such guns. See fig. 11.

Make the length, A d, of the plank for either check of the carriage equal to seven feet and a half together with 10 diameters of the shot of the gun; its height, A B, equal to three diameters and three quarters of a diameter; and the breadth, A B, of the check itself equal to three diameters and a quarter. Take B C equal to eight diameters, together with 20 such parts as those, of which one diameter of the shot contains 24; from the point, A, as centre with the radius, B C, describe an arc, in which apply as a chord C D, equal to 70 such parts, and draw the right lines A D, B C. On B C set off B E equal to the head A B, or the height of the check, and from the point, E, set off towards the point, B, the right line, E F, equal to each of the other such parts, making E S equal to 18 such parts or the width of the trunnion-hole, of which the centre is about a quarter of an inch below B C or the upper surface of the check. From the point, r, draw the right line r K, perpendicular to A D, and on A D take F H equal to 30 such parts for the breadth of the axle-tree, which is let in or sunk into the check about an inch. On F H constitute a square, and from the intersection, I, of its diagonals as centre with a radius of 20 inches describe an arc, which will represent a part of one of the wheels. Apply a straight ruler touching this arc so as to the said plank that the distance M L, between the points, M, L, where its edge coincides with the edges of the plank, may be equal to three diameters, and from these points draw M N, L O, perpendicular to K M, and equal each of them to two diameters. Then if the right lines C N, N O, and D M, be drawn and the under part of the trail be described as above pointed out from K, the bisecting point of the right line, M Q, as a centre, we shall have A B C N O P M D A for the outline of the check.

And the construction of the plan of such a carriage is as follows. See fig. 12.

Draw any indefinite right line, A B. In it take C D equal to seven diameters and 17 such parts. Through the points, C, D, draw right lines, E F, K L, at right angles to A B, making C E, C F, equal each of them to 27; 5 such parts, and D K, D L, equal each of them to 32; 5 such parts. Then right lines drawn through the points F, K, and E, K, will determine or ascertain the width of the carriage on the inside. And if parallel to these lines two other right lines be drawn at the distance from them respectively of 18 such parts, we shall have the thicknesses of the cheeks and the outside width of the carriage.

The positions, M, N, of the trunnion-holes are determined by setting off on both sides of the points, E, F, nine such parts for the radius of each of the trunnions. And if C a be taken equal to a B in the last fig. or fig. 11. the line, R Q, drawn at right angles to A B, will determine the breadth of the carriage; and its total length, a, is ascertained from the said figure. The other parts of the construction are the same as above.

Figure 13 is the elevation of a fix-powder travelling carriage with the horns marked on it, and figure 14 is the plan of the same.

Field-carriages are shorter and much lighter than those above mentioned, and described, being in these respects proportioned
portioned to the weights and lengths of the pieces mounted on them. They are nearly in the same form, however, but have their wheels eight inches lower, which reduction of height makes them perhaps lower than they ought to be.

Their dimensions are the following:

<table>
<thead>
<tr>
<th>Calibers or natures of the guns</th>
<th>Pounder</th>
<th>12.</th>
<th>Founder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inches</td>
<td>Inches</td>
<td>Inches</td>
</tr>
<tr>
<td>Plain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thickness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height before</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ditto at the centre</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ditto at the trail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of the trail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length from head to centre</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width within before</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breadth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of the trail han-spoke</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diameter of ditto at the trail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spokes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diameter of socket</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Felloes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breadth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spokes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thickness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of axle-tree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breadth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of each arm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diameters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linch</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The length of the plank for either cheek in one of these carriages is equal to four feet, together with thirteen diameters of the flat. And the width within varies with the thickness of the metal in the piece.

The contrivance for travelling carriages answers likewise for field carriages, if these dimensions be made use of instead of those delivered above. See figs. 15 and 16. The latter, however, differ from the former in the following particulars.

They have no bed-transoms, as sewers, instead of wedges, are made use of for elevating or depressing them; for which reason the centre transom in each of them is two diameters broad, and but one thick, and is so placed in the middle of the height of the cheeks, that the neck of the caseable answers to the middle of the breadth of the transom, where the saw is fixed.

On each side of one of these carriages there is a box or locker, about twenty-three inches, or two feet long, with its upper surface even with, or rather above an inch above the upper part of the axle-tree, and extending from thence to the trail. These boxes, or lockers, serve for carrying shot on a march, and are covered each of them by another box holding cartridges, which slides on and is fastened with a bolt.

The iron-work in one of these carriages is nearly the same as that in a travelling carriage, but not quite so strong. It has but one garnish-bolt, and no garnish-nails. The eye-bolt next to the joint-bolt passes through the axle-tree band behind, and not before, as in other carriages, and the fore part of this band is only fastened by the fore eye-bolt. The draught-locks are fixed sometimes to the break-transom plates, and sometimes to the axle-tree. But the nearer they are fixed on a level with the breaks of the horses the better. There are sometimes book to the trail transom-plates, and sometimes nails about four inches long. The fakers have also hooks, to which are fastened the ropes, by which the gunners or their assistants drag the gun along.

A galloper-carriage is for a pound and a half gun. Fig. 19 is an elevation of one, and fig. 20 a plan of one. The following are its dimensions.

<table>
<thead>
<tr>
<th>Carriage</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total length of each shaft</td>
<td>11</td>
<td>0.27</td>
</tr>
<tr>
<td>From the fore end to the fore cro's-bar</td>
<td>6</td>
<td>4.10</td>
</tr>
<tr>
<td>From the hind end to the round part</td>
<td>5</td>
<td>0.11</td>
</tr>
<tr>
<td>Height of the hind end</td>
<td>0</td>
<td>6.0</td>
</tr>
<tr>
<td>Height of the fore end</td>
<td>0</td>
<td>6.0</td>
</tr>
<tr>
<td>Breadth behind and before</td>
<td>0</td>
<td>6.0</td>
</tr>
<tr>
<td>Breadth in the middle</td>
<td>0</td>
<td>6.0</td>
</tr>
<tr>
<td>Inside width behind</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Do. of the fore cro's-bar</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Do. of the hind end</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>From the hind end to the axle-tree</td>
<td>0</td>
<td>1.12</td>
</tr>
<tr>
<td>Cro's bar from the hind end</td>
<td>1</td>
<td>0.12</td>
</tr>
<tr>
<td>Length of each cheek</td>
<td>4</td>
<td>2.11</td>
</tr>
<tr>
<td>Breath of do.</td>
<td>0</td>
<td>2.5</td>
</tr>
<tr>
<td>Height of do.</td>
<td>0</td>
<td>2.5</td>
</tr>
<tr>
<td>Inside width before</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Do. of the hind end</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total length of the axle-tree</td>
<td>6</td>
<td>4.18</td>
</tr>
<tr>
<td>Length of the body of do.</td>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>Length of each arm</td>
<td>6</td>
<td>4.84</td>
</tr>
<tr>
<td>Breath of the body</td>
<td>0</td>
<td>5.0</td>
</tr>
<tr>
<td>Height of do.</td>
<td>0</td>
<td>6.0</td>
</tr>
<tr>
<td>Greatest diameter of each arm</td>
<td>0</td>
<td>6.0</td>
</tr>
<tr>
<td>Least diameter of do.</td>
<td>0</td>
<td>3.3</td>
</tr>
<tr>
<td>Diameter of each wheel</td>
<td>4</td>
<td>3.13</td>
</tr>
<tr>
<td>Length of the nave</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Diameter of the body of do.</td>
<td>0</td>
<td>1.10</td>
</tr>
<tr>
<td>Diameter of the middle of do.</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>Do. of the hind end of do.</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>Breath of each spike</td>
<td>0</td>
<td>1.5</td>
</tr>
<tr>
<td>Thickness of do.</td>
<td>0</td>
<td>3.0</td>
</tr>
<tr>
<td>Breadth of each felloe</td>
<td>0</td>
<td>3.0</td>
</tr>
<tr>
<td>Thickness of do.</td>
<td>0</td>
<td>4.5</td>
</tr>
</tbody>
</table>

The rest of the dimensions not inserted here may be taken from the draughts, fig. 19 and 22. A galloper-carriage is made with shafts to be drawn, as we have already observed, without a limber.

The dimensions of limbers both for travelling and field-carriages are the same, and are the following.

Nature
## CARRIAGE.

<table>
<thead>
<tr>
<th>Nature of the guns</th>
<th>24 Pounder</th>
<th>28 Pounder</th>
<th>32 Pounder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of each wheel</td>
<td>48.0</td>
<td>48.0</td>
<td>48.0</td>
</tr>
<tr>
<td>Length of the nave</td>
<td>16.0</td>
<td>16.0</td>
<td>16.0</td>
</tr>
<tr>
<td>Diameter of the body of do.</td>
<td>13.5</td>
<td>13.5</td>
<td>13.5</td>
</tr>
<tr>
<td>Do. of the middle of do.</td>
<td>14.0</td>
<td>14.0</td>
<td>14.0</td>
</tr>
<tr>
<td>Do. of the line of do.</td>
<td>12.0</td>
<td>12.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Breadth of each felloe</td>
<td>4.5</td>
<td>4.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Height of do.</td>
<td>5.0</td>
<td>4.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Breadth of each spoke</td>
<td>1.8</td>
<td>1.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Thickness of do.</td>
<td>4.0</td>
<td>3.5</td>
<td>3.0</td>
</tr>
<tr>
<td>The length of the axle-tree</td>
<td>78.0</td>
<td>76.0</td>
<td>74.0</td>
</tr>
<tr>
<td>Length of the body of do.</td>
<td>40.0</td>
<td>40.0</td>
<td>40.0</td>
</tr>
<tr>
<td>Height of the body of do.</td>
<td>7.0</td>
<td>7.0</td>
<td>7.0</td>
</tr>
<tr>
<td>Breadth of the body of do.</td>
<td>6.0</td>
<td>5.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Length of each arm of do.</td>
<td>10.0</td>
<td>10.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Diameter of the body of do.</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Do. of the line of do.</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>The length of each shaft</td>
<td>94.0</td>
<td>94.0</td>
<td>94.0</td>
</tr>
<tr>
<td>Breadth of hind end of do.</td>
<td>6.0</td>
<td>5.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Do. of fore end of do.</td>
<td>3.0</td>
<td>3.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Height of hind end of do.</td>
<td>3.5</td>
<td>3.3</td>
<td>3.0</td>
</tr>
<tr>
<td>Do. of fore end of do.</td>
<td>3.0</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Length of the beams</td>
<td>110.0</td>
<td>110.0</td>
<td>110.0</td>
</tr>
<tr>
<td>Breadth of do. at hind end</td>
<td>4.5</td>
<td>4.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Do. of do. at fore end</td>
<td>4.0</td>
<td>3.5</td>
<td>3.0</td>
</tr>
<tr>
<td>The height of the bolder</td>
<td>12.5</td>
<td>10.0</td>
<td>8.0</td>
</tr>
<tr>
<td>The length of do.</td>
<td>40.0</td>
<td>40.0</td>
<td>40.0</td>
</tr>
<tr>
<td>The breadth of do.</td>
<td>6.0</td>
<td>5.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Breadth of the fore cros-fbar</td>
<td>4.5</td>
<td>4.0</td>
<td>3.5</td>
</tr>
<tr>
<td>The height of do.</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Breadth of hind cros-fbar</td>
<td>3.5</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>The height of do.</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Distance of axe-tree from the fore cros-fbar</td>
<td>11.5</td>
<td>11.5</td>
<td>11.5</td>
</tr>
</tbody>
</table>

The shafts of limbers are about two feet open before, two feet ten inches in the middle, and a little less near the axle-tree according as the wood, out of which they are made, happens to be more or less crooked. For it ought never to be cut across the grain for fear of weakening it too much. The height of the bolder diminishes towards both ends, as in fig. 22. That given in the immediately preceding table is for the middle of it.

The following are the names of the iron, or pieces of iron-work in the shafts and beams of limbers with the number of each. See fig. 21, 22, and 23.

- Limber-bolt
- Shaft-rings
- Shaft-pins with chains
- Breech-hooks
- Ridge-chain with hook and loop
- Limber-chain with hook and rings
- Single fore lock keys
- Diamond-headed nails
- Dog-nails
- Bolter-loops
- The pintle
- The pintle-wafers
- Stubs for bolter-loops

The iron-work of a limber is the same as that of a limber for a field-carriage, with this exception, that in iron there are only four garnet nails, viz. two of a side, because it is so short as not to admit of more. The wheels and axle-tree are the same as those of an 18 and 12 pounder-carriage.

The following are the dimensions of an eight-inch howitzer-carriage.

| Diameter of each wheel | 18.0 |
| Length of each check | 8.0 |
| The thickness of do. | 4.5 |
| The height of do. before | 1.0 |
| Do. of do. at the centre | 1.4 |
| Do. of do. at the trail | 1.2 |
| Length of the trail | 1.3 |
| Height of the plank | 1.6 |
| Distance from the head to the centre | 3.7 |
| Do. of trunnions from the head | 0.9 |
| Breach-trunnion | 1.25 |
| Height | 0.2 |
| Thickness | 0.4 |
| Centre-trunnion | 1.45 |
| Height | 0.4 |
| Thickness | 0.4 |
| Length | 1.7 |
| Trail-trunnion | 1.3 |
| Breadth | 0.4 |
| Thickness | 0.4 |

### Of mortar-beds.

A mortar-bed answers for mounting a mortar on as a gun carriage does for mounting a cannon on. Limb mortar-beds are commonly made solid, each of them consisting of four pieces of timber well secured and strongly fastened together with iron-work, except those for royals and coehorns, each of which is made out of a single block.

### Bores of the mortars and natures of the beds

<table>
<thead>
<tr>
<th>Diameter in inches</th>
<th>4 inch</th>
<th>5 inch</th>
<th>6 inch</th>
<th>7 inch</th>
<th>8 inch</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lower bed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>84.0</td>
<td>69.0</td>
<td>50.0</td>
<td>40.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Breadth</td>
<td>32.0</td>
<td>24.0</td>
<td>20.0</td>
<td>16.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Height</td>
<td>12.0</td>
<td>10.0</td>
<td>9.0</td>
<td>8.0</td>
<td>7.0</td>
</tr>
<tr>
<td><strong>Upper bed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>83.0</td>
<td>66.0</td>
<td>49.0</td>
<td>35.0</td>
<td>25.0</td>
</tr>
<tr>
<td>Breadth</td>
<td>35.0</td>
<td>25.0</td>
<td>18.0</td>
<td>14.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Height</td>
<td>13.0</td>
<td>10.0</td>
<td>9.0</td>
<td>5.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

### Of the trunnions

| Diameter of the trunnions from the fore end | 34.0 | 20.0 | 13.5 | 9.0  |
| The diameter of the trunnions in the middle | 7.2  | 6.4  | 5.4  | 3.4  |
| The depth of the trunnions in the middle | 7.2  | 6.4  | 5.4  | 3.4  |
CARRIAGE.

The distance of the trunnion-holes is measured from the quarter round, and not from the very end of the bed. The joint of the two pieces of the upper bed of a 13, 10, and 8 inch mortar-bed is so contrived as not to be directly over the joint of the two pieces in the lower bed.

The following are the names and numbers of the irons in a 13, 10, or 8 inch mortar bed. See figs. 24, 25, and 26.
a. Cap-squares
b. Eye-bolts
c. Joint-bolts
d. Under and upper bed-bolts
e. Dowel-bars
f. Rings with bolts
g. Riveting plates
h. End riveting plates
i. Middle plate
j. Riveting bolts
k. Square riveting bolts
l. Traversing bolts
m. Keys, chains, and flaps

Names and numbers of irons in a royal or cochorn bed.
a. Cap-squares
b. Eye-bolts
c. Joint-bolts
d. Riveting bolt with ring
f. Handles with flarts
g. Square riveting plates
h. Keys, chains, and flaps

Mr. Muller gives the following dimensions for mortar beds to suit his general construction of three kinds of mortars, holebolting, as in his construction of them, the diameter of the bore to be always divided into thirty equal parts, as a scale to go by.

<table>
<thead>
<tr>
<th>Diameter of the bore in</th>
<th>30 equal parts.</th>
<th>30 equal parts.</th>
<th>30 equal parts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>each kind divided into</td>
<td>Diameter of the</td>
<td>Diameter of the</td>
<td>Diameter of the</td>
</tr>
<tr>
<td></td>
<td>bore of the</td>
<td>bore of the</td>
<td>bore of the</td>
</tr>
<tr>
<td></td>
<td>diameter of the</td>
<td>diameter of the</td>
<td>diameter of the</td>
</tr>
<tr>
<td></td>
<td>bore</td>
<td>bore</td>
<td>bore</td>
</tr>
<tr>
<td>Lower bed { Length</td>
<td>6 0</td>
<td>5 10</td>
<td>4 25</td>
</tr>
<tr>
<td>Breadth</td>
<td>2 10</td>
<td>2 25</td>
<td>2 25</td>
</tr>
<tr>
<td>Thickness</td>
<td>5 28</td>
<td>5 28</td>
<td>4 25</td>
</tr>
<tr>
<td>Upper bed { Length</td>
<td>2 8</td>
<td>2 20</td>
<td>1 14</td>
</tr>
<tr>
<td>Breadth</td>
<td>8 5</td>
<td>8 5</td>
<td>1 14</td>
</tr>
<tr>
<td>Thickness</td>
<td>12 25</td>
<td>12 25</td>
<td>1 14</td>
</tr>
<tr>
<td>The breadth of the ogee</td>
<td>6 6</td>
<td>5 0</td>
<td>4 5</td>
</tr>
<tr>
<td>The breadth of the</td>
<td>6 6</td>
<td>5 0</td>
<td>4 5</td>
</tr>
<tr>
<td>quarter round the</td>
<td>6 6</td>
<td>5 0</td>
<td>4 5</td>
</tr>
<tr>
<td>fillet</td>
<td>1 10</td>
<td>1 10</td>
<td>1 13</td>
</tr>
<tr>
<td>The diameter of each of</td>
<td>1 10</td>
<td>1 10</td>
<td>1 13</td>
</tr>
<tr>
<td>the trunnion holes</td>
<td>1 10</td>
<td>1 10</td>
<td>1 13</td>
</tr>
<tr>
<td>The depth of each of</td>
<td>1 15</td>
<td>1 15</td>
<td>1 15</td>
</tr>
<tr>
<td>the trunnion holes</td>
<td>1 15</td>
<td>1 15</td>
<td>1 15</td>
</tr>
<tr>
<td>The interval between</td>
<td>1 15</td>
<td>1 15</td>
<td>1 15</td>
</tr>
<tr>
<td>them</td>
<td>1 15</td>
<td>1 15</td>
<td>1 15</td>
</tr>
<tr>
<td>The length of each of</td>
<td>1 15</td>
<td>1 15</td>
<td>1 15</td>
</tr>
<tr>
<td>them</td>
<td>1 15</td>
<td>1 15</td>
<td>1 15</td>
</tr>
</tbody>
</table>

The dimensions of the first of these kinds of mortar beds correspond nearly to those of the mortar beds that have been generally in use.

The general dimensions of the iron work for such beds are the following:

| Of each cap square { Length | 1 18 | 1 14 | 1 10 |
|                        | Breadth | 0 12 | 0 10 | 0 10 |
|                        | Thickness | 0 10 | 0 10 | 0 10 |
| Fore end from the      | 0 16 | 0 16 | 0 16 |
| trunnion-hole          | 0 16 | 0 16 | 0 16 |
| Of each eye-bolt-head  | 1 10 | 1 10 | 1 10 |
|                        | Height | 0 10 | 0 10 | 0 10 |
|                        | Breadth | 0 10 | 0 10 | 0 10 |
|                        | Thickness | 0 10 | 0 10 | 0 10 |
| The diameter of each   | 1 10 | 1 10 | 1 10 |
| joint bolt head        | 2 0 | 2 0 | 2 0 |
| The thickness of ditto | 2 0 | 2 0 | 2 0 |
| Distance from the      | 2 0 | 2 0 | 2 0 |
| trunnion-hole          | 1 10 | 1 10 | 1 10 |
| The length of each     | 1 10 | 1 10 | 1 10 |
| traversing-bolt        | 1 10 | 1 10 | 1 10 |
| The diameter of the    | 1 10 | 1 10 | 1 10 |
| head of ditto          | 1 10 | 1 10 | 1 10 |
| The diameter of the    | 1 10 | 1 10 | 1 10 |
| bolt itself            | 1 10 | 1 10 | 1 10 |
| The distance from the  | 1 10 | 1 10 | 1 10 |
| end                     | 1 10 | 1 10 | 1 10 |
| Its distance from      | 1 10 | 1 10 | 1 10 |
| below                   | 1 10 | 1 10 | 1 10 |
| Of the middle plate {   | Length | 2 0 | 2 0 | 2 0 |
|                        | Breadth | 0 10 | 0 10 | 0 10 |
|                        | Thickness | 0 10 | 0 10 | 0 10 |
| The length of the      | 2 0 | 2 0 | 2 0 |
| bed-bolt               | 2 0 | 2 0 | 2 0 |
| The diameter of ditto  | 2 0 | 2 0 | 2 0 |
| The diameter of the    | 2 0 | 2 0 | 2 0 |
| ring                   | 2 0 | 2 0 | 2 0 |
| The thickness of the   | 2 0 | 2 0 | 2 0 |
| ring                   | 2 0 | 2 0 | 2 0 |
He supposes the mortars, contrary to what has been the common practice, to be so placed in their beds as to be moveable, and capable of being raised from an angle of 10 degrees to any under 90, and also the cavity in each bed to be so made as to receive the wedges for raising the mortar with.

Sea-Mortar-beds are likewise made solid with very strong timbers but differ from the land-mortar-beds in point of form or figure, and have each of them a hole in the middle, or centre, for receiving the pintle-pin, or strong iron bolt, round which the bed may turn. They are placed on strong wooden frames fixed into the bomb-ketches, to which the pintles are fastened. The fore-part of a sea-mortar-bed is an arc of a circle described from the centre of the pintle-hole.

The following are their dimensions in inches. See fig. 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, and 39.

<table>
<thead>
<tr>
<th>Diameters of the bores</th>
<th>13 inch 10 inch inches, inches.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The lengths of the beds</td>
<td>94 84</td>
</tr>
<tr>
<td>The breadths of the beds</td>
<td>54 47</td>
</tr>
<tr>
<td>The heights of the beds</td>
<td>27 23</td>
</tr>
<tr>
<td>Distances of the pintle-holes from the fore-ends</td>
<td>39 32</td>
</tr>
<tr>
<td>Diameters of the pintle-holes</td>
<td>6.5 6.5</td>
</tr>
<tr>
<td>Distances of the trunnions from the fore-ends</td>
<td>46 42</td>
</tr>
<tr>
<td>Diameters of the trunnion holes</td>
<td>10 8</td>
</tr>
<tr>
<td>Depths of the trunnion-holes</td>
<td>8 5</td>
</tr>
<tr>
<td>Diameters of the circular beds</td>
<td>59 59</td>
</tr>
<tr>
<td>Heights of the circular beds</td>
<td>8 6</td>
</tr>
<tr>
<td>Distances to the bed bolts</td>
<td>16 15</td>
</tr>
<tr>
<td>Depths of the cavities</td>
<td>15 12</td>
</tr>
<tr>
<td>Their openings above</td>
<td>30 21</td>
</tr>
<tr>
<td>The lengths of the bed bolts</td>
<td>53 44</td>
</tr>
<tr>
<td>Their lengths below</td>
<td>29 22</td>
</tr>
<tr>
<td>Their breadths</td>
<td>14 12</td>
</tr>
</tbody>
</table>

And the names and numbers of the iron in both the 13-inch mortar-bed and 16-inch mortar-bed are the following:

| a. Cap-squares | 2 |
| b. Eye-bolts | 6 |
| c. Loop-bolts | 4 |
| d. Travelling-bolts | 4 |
| e. Middle-plate | 3 |
| f. Rivetting-plate | 1 |
| g. Rivetting-bolts | 6 |
| b. Cross-bed bolts | 7 |
| i. Square rivetting plates for ditto | 7 |
| k. Down bed-bolts | 15 |
| m. Bed-bolster plates | 2 |
| Keys, chains and staples | 6 |
| Nails to the bed-bolster bed | 4 |
| Bed-bolster rings with loops | 2 |
| Tumbrils, as we have already observed, are carriages with two wheels, only are commonly made of for carrying tools for miners, artificers, and pioneers, and sometimes the money of the army. The dimensions of one are the following. See fig. 40 and 41. |  |

| d. Height of ditto | 6.7 |
| Ditto of the body of ditto | 4.5 |
| Ditto of the linch of ditto | 3 |
| The total length of each shaft | 147 |
| The distance from the hind end of each to the crofs-bar | 7 |
| Ditto from the hind cross-bar to the fore end | 62 |
| Distance from the fore-cut to the fore-end | 78 |
| The breadth of ditto behind | 4 |
| Ditto of ditto at the fore-cut | 4.5 |
| Ditto of ditto in the middle | 3.5 |
| Ditto of ditto at the fore-end | 2.5 |
| Height of ditto from the hind end to the fore-cut | 3.5 |
| Ditto of ditto at the fore-end | 2.3 |
| Inside width behind and at the fore-cut | 3.5 |
| Ditto in the middle | 35 |
| Ditto at the fore end | 25 |
| Crofs-bars \{ Breadth \} 3.5 |
| \{ Thickness \} 2 |
| \{ Length \} 31 |
| Fore-cut | |
### Carriage

<table>
<thead>
<tr>
<th>Item</th>
<th>Length (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fore-cut</td>
<td>6</td>
</tr>
<tr>
<td>Breadth</td>
<td>2</td>
</tr>
<tr>
<td>Thickness</td>
<td>53</td>
</tr>
<tr>
<td>Raves</td>
<td>2</td>
</tr>
<tr>
<td>Breadth</td>
<td>56</td>
</tr>
<tr>
<td>Thickness</td>
<td>1</td>
</tr>
<tr>
<td>Standards</td>
<td>62</td>
</tr>
<tr>
<td>Breadth</td>
<td>62</td>
</tr>
<tr>
<td>Thickness</td>
<td>13</td>
</tr>
<tr>
<td>Head-bars</td>
<td>3</td>
</tr>
<tr>
<td>Breadth</td>
<td>1</td>
</tr>
<tr>
<td>Thickness</td>
<td>5</td>
</tr>
<tr>
<td>Uprights</td>
<td>2</td>
</tr>
<tr>
<td>Breadth</td>
<td>6</td>
</tr>
<tr>
<td>Thickness</td>
<td>1</td>
</tr>
</tbody>
</table>

_Ditto_ as we have observed above, are chiefly for conveying mortars and their beds from one place to another.

The dimensions of one of them are the following. See fig. 43, 44, and 45.

<table>
<thead>
<tr>
<th>Item</th>
<th>Length (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The height of each fore-wheel</td>
<td>6</td>
</tr>
<tr>
<td>The length of the nave</td>
<td>7</td>
</tr>
<tr>
<td>The diameter of the body of ditto</td>
<td>2</td>
</tr>
<tr>
<td>Ditto of the middle of ditto</td>
<td>5</td>
</tr>
<tr>
<td>Ditto of the linch of ditto</td>
<td>3</td>
</tr>
<tr>
<td>The height of each felloe</td>
<td>8</td>
</tr>
<tr>
<td>The breadth of ditto</td>
<td>3</td>
</tr>
<tr>
<td>The breadth of each spoke</td>
<td>2</td>
</tr>
<tr>
<td>The thickness of ditto</td>
<td>4</td>
</tr>
<tr>
<td>The height of each hind-wheel</td>
<td>4</td>
</tr>
<tr>
<td>The length of its nave</td>
<td>6</td>
</tr>
<tr>
<td>The diameter of the body of ditto</td>
<td>2</td>
</tr>
<tr>
<td>The diameter of the middle of ditto</td>
<td>5</td>
</tr>
<tr>
<td>The diameter of the linch of ditto</td>
<td>3</td>
</tr>
<tr>
<td>The height of each of its felloes</td>
<td>8</td>
</tr>
<tr>
<td>The breadth of each felloe</td>
<td>4</td>
</tr>
<tr>
<td>The breadth of each of its spokes</td>
<td>3</td>
</tr>
<tr>
<td>The thickness of each of its spokes</td>
<td>2</td>
</tr>
<tr>
<td>The total length of the fore axle-tree</td>
<td>5</td>
</tr>
<tr>
<td>The length of its body</td>
<td>4</td>
</tr>
<tr>
<td>The breadth of its body</td>
<td>6</td>
</tr>
<tr>
<td>The height of its body</td>
<td>5</td>
</tr>
<tr>
<td>The length of each of its arms</td>
<td>6</td>
</tr>
<tr>
<td>The diameter of the body of each ditto</td>
<td>4</td>
</tr>
<tr>
<td>The diameter of the linch of each</td>
<td>3</td>
</tr>
<tr>
<td>The length of the bolider</td>
<td>4</td>
</tr>
<tr>
<td>The breadth of the bolider</td>
<td>5</td>
</tr>
<tr>
<td>The height of ditto</td>
<td>5</td>
</tr>
<tr>
<td>The total length of the hind axle-tree</td>
<td>6</td>
</tr>
<tr>
<td>The length of the body of ditto</td>
<td>3</td>
</tr>
<tr>
<td>The breadth of ditto</td>
<td>7</td>
</tr>
<tr>
<td>The height of the body of ditto</td>
<td>8</td>
</tr>
<tr>
<td>The length of each arm of ditto</td>
<td>9</td>
</tr>
<tr>
<td>The height of the body of each arm of ditto</td>
<td>10</td>
</tr>
<tr>
<td>The diameter of the body of each arm of ditto</td>
<td>11</td>
</tr>
<tr>
<td>The length of each arm of ditto</td>
<td>12</td>
</tr>
<tr>
<td>The diameter of each arm of ditto</td>
<td>13</td>
</tr>
<tr>
<td>The length of the fore bolider</td>
<td>14</td>
</tr>
<tr>
<td>The breadth of the fore bolider</td>
<td>15</td>
</tr>
<tr>
<td>The height of do.</td>
<td>16</td>
</tr>
<tr>
<td>The length of each thrust</td>
<td>17</td>
</tr>
<tr>
<td>The height of each thrust</td>
<td>18</td>
</tr>
<tr>
<td>The interval between them</td>
<td>19</td>
</tr>
</tbody>
</table>

The principal use of a truck carriage, as we have already observed, is to carry timber and other heavy articles from one place to another, and sometimes guns and mortars, where their own carriages cannot go.

The following are the dimensions of one. See fig. 45, 46, 47, and 48.

<table>
<thead>
<tr>
<th>Item</th>
<th>Length (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The length of the body of the fore axle-tree</td>
<td>3</td>
</tr>
<tr>
<td>The breadth of the body of do.</td>
<td>5</td>
</tr>
<tr>
<td>The height of the body of do.</td>
<td>6</td>
</tr>
<tr>
<td>The length of arm of do.</td>
<td>7</td>
</tr>
<tr>
<td>The diameter of each arm of do.</td>
<td>6</td>
</tr>
<tr>
<td>The length of the body of the hind axle-tree</td>
<td>8</td>
</tr>
<tr>
<td>The breadth of the body of do.</td>
<td>9</td>
</tr>
<tr>
<td>The height of the body of do.</td>
<td>10</td>
</tr>
<tr>
<td>The length of each arm of do.</td>
<td>11</td>
</tr>
<tr>
<td>The diameter of each arm of do.</td>
<td>12</td>
</tr>
<tr>
<td>The length of each fide-piece</td>
<td>13</td>
</tr>
<tr>
<td>The breadth of each fide-piece</td>
<td>14</td>
</tr>
<tr>
<td>The height of each fide-piece</td>
<td>15</td>
</tr>
<tr>
<td>The interval between them</td>
<td>16</td>
</tr>
<tr>
<td>Interval between the fide-pieces and fore axle-tree</td>
<td>17</td>
</tr>
<tr>
<td>Ditto between the fide-pieces and hind axle-tree</td>
<td>18</td>
</tr>
<tr>
<td>The length of the fore bolider</td>
<td>19</td>
</tr>
<tr>
<td>The breadth of do.</td>
<td>20</td>
</tr>
<tr>
<td>The height of do.</td>
<td>21</td>
</tr>
<tr>
<td>The length of each thrust</td>
<td>22</td>
</tr>
<tr>
<td>The height of each thrust</td>
<td>23</td>
</tr>
<tr>
<td>The opening of do. near the bolt</td>
<td>24</td>
</tr>
<tr>
<td>Ditto in the middle</td>
<td>25</td>
</tr>
<tr>
<td>Ditto before</td>
<td>26</td>
</tr>
<tr>
<td>The breadth of each shaft before</td>
<td>27</td>
</tr>
<tr>
<td>The breadth of each in the middle</td>
<td>28</td>
</tr>
<tr>
<td>The breadth of each at the bolt</td>
<td>29</td>
</tr>
</tbody>
</table>

_Distance_
CARRIAGE.

Distance from the end to the straight cross-box - 12

Fore-guide

Length - 12

Breadth - 30

Height - 21

Interval - 4

The diameter of each truck - 251

The thickness of each truck - 4

The breadth of the cross-piece fixed to the fore end of the side-pieces - 5

The height of do. before - 3

The height of do. behind - 1.5

The breadth of the cross-piece under the side-pieces behind the fore-holder - 10

The thickness of do. - 1.5

The plan and elevation of the carriage shew the iron-work sufficiently.

The following are the dimensions of a ponton, or ponton carriage.

The diameter of each wheel both behind and before - 6.3

The length of each nave - 1.5

The diameter of the body of do. - 14

The diameter of the middle of do. - 15

The diameter of the linch of do. - 12

The breadth of each felloe - 4.5

The thickness of do. - 3.5

The length of each axle-tree - 86

The length of the body of do. - 46

The breadth of the body of do. - 8.5

The height of do. - 6

The length of each arm of do. - 18

The diameter of the body of each arm - 6

The diameter of the linch of do. - 3.8

The length of each of the under side-pieces - 210

The breadth of do. - 7

The height of do. - 6

The length of each of the upper side-pieces - 266

The breadth of do. - 5

The height of do. - 2.6

Of the fore and hind cross-bars

Breadth - 6.5

Height - 3.5

Length - 52

Distance from the centre of the fore axle-tree from the fore end - 10

Distance from the centre of the hind axle-tree from the hind end - 9.3

Opening between the upper side-pieces - 51

Ditto between the under side-pieces - 18

The distance of the fore-supporter from the fore-end - 45

The distance of the hind-supporter from the fore-end - 45

The height of each supporter - 32

The artillery carriage, commonly called a travelling forge, is the carriage of a sort of portable smith's shop, at which all kind of Smith's work is done in camp, and even on a march. Formerly it used to have but two wheels, and had wooden supports to prop up the forge for working at when in the park of artillery. But now it has usually four wheels, and is much more convenient.

The dimensions of such a carriage are the following:

The height of each fore-wheel - 104

The length of its nave - 14

The diameter of the body of do. - 12

The diameter of the middle of do. - 13

The diameter of the linch of do. - 9

The breadth of each felloe - 3

The height of do. - 4

The breadth of each spoke - 1.7

The thickness of do. - 3

The height of each hind-wheel - 6.4

The length of its nave - 14

The diameter of the body of do. - 12

The diameter of the middle of do. - 13

The diameter of the linch of do. - 9

The breadth of each felloe - 4

The height of do. - 3

The breadth of each spoke - 1.7

The thickness of do. - 3

The total length of the fore axle-tree - 76

The total length of the hind axle-tree - 76

The length of the body of each - 42

The breadth of the body of each - 7

The height of the body of each - 7

The length of each arm of each - 17

The diameter of the body of do. - 7

The diameter of the linch of do. - 3

The total length of each shaft with the side - 263

The breadth of do. behind - 4

The breadth of do. in the middle - 4.5

The breadth of do. before - 2.5

The height of do. behind - 3

The height of do. in the middle - 2.8

The height of do. before - 2.7

The opening between them before - 2.7

Ditto behind - 3.2

The length of each rive - 124

The breadth of do. - 3

The height of do. - 6

The length of each upright - 27

The breadth of do. - 3

The thickness of do. - 2.2

The breadth of the fore cross-bar - 3

The thickness of do. - 2.2

The breadth of the hind cross-bar - 2

The thickness of do. - 2.2

Distance from the fore end to the fore axle-tree - 23

Distance from the hind end to the hind axle tree - 14

Distance between - 74

An ammunition-wagon is an artillery carriage for carrying all sorts of military stores. It has four wheels, has its sides raised in flaps and raves, and is lined on the inside with baffle or wicker-work. It carries 12 cwt. and is sometimes employed for carrying bread. Its dimensions are the following. See fig. 49, 52, 54, and 52.

The height of each of the fore wheels - 48

The length of its nave - 13

The diameter of the body of do. - 12

The diameter of the middle of do. - 14

The diameter of the linch of do. - 10

The height of each felloe - 4

The breadth of do. - 3

The breadth of each spoke - 1.5

The thickness of do. - 3

The height of each of the hind wheels - 60

The length of its nave - 13

The diameter of the body of do. - 12

The diameter of the middle of do. - 14

The diameter of the linch of do. - 10

The breadth of each of its felloes - 3

The height of each do. - 4

The breadth of each spoke - 1.8

The thickness of do. - 3.5

The
<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>The total length of the fore axle-tree</td>
<td>72</td>
</tr>
<tr>
<td>The length of its body</td>
<td>40</td>
</tr>
<tr>
<td>The breadth of its body</td>
<td>5</td>
</tr>
<tr>
<td>The height or depth of its body</td>
<td>6</td>
</tr>
<tr>
<td>The length of each of its arms</td>
<td>16</td>
</tr>
<tr>
<td>The diameter of the body</td>
<td>5</td>
</tr>
<tr>
<td>The diameter of the hind axle-tree</td>
<td>3</td>
</tr>
<tr>
<td>The total length of the hind axle-tree</td>
<td>70</td>
</tr>
<tr>
<td>The length of its body</td>
<td>65</td>
</tr>
<tr>
<td>The breadth of its body</td>
<td>6</td>
</tr>
<tr>
<td>The height or depth of its body</td>
<td>16</td>
</tr>
<tr>
<td>The diameter of the body</td>
<td>5</td>
</tr>
<tr>
<td>The diameter of the hind of do</td>
<td>3</td>
</tr>
<tr>
<td>The length of the fore-bollter</td>
<td>49</td>
</tr>
<tr>
<td>The breadth of do</td>
<td>5</td>
</tr>
<tr>
<td>The height or depth of do</td>
<td>46</td>
</tr>
<tr>
<td>The length of the hind of do</td>
<td>5</td>
</tr>
<tr>
<td>The length of the do</td>
<td>49</td>
</tr>
<tr>
<td>The breadth of do</td>
<td>5</td>
</tr>
<tr>
<td>The height of do</td>
<td>4-7</td>
</tr>
<tr>
<td>Sommers and sides</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>144</td>
</tr>
<tr>
<td>Breadth</td>
<td>3</td>
</tr>
<tr>
<td>Height</td>
<td>120</td>
</tr>
<tr>
<td>The length of the pole</td>
<td></td>
</tr>
<tr>
<td>Its square before</td>
<td>4</td>
</tr>
<tr>
<td>Its square behind</td>
<td>3</td>
</tr>
<tr>
<td>The length of the middle bar</td>
<td>40</td>
</tr>
<tr>
<td>The breadth of do</td>
<td>3-5</td>
</tr>
<tr>
<td>The height or depth of do</td>
<td>6-5</td>
</tr>
<tr>
<td>Hind-guide</td>
<td></td>
</tr>
<tr>
<td>Length to the axle-tree</td>
<td>28</td>
</tr>
<tr>
<td>Breadth to the axle-tree</td>
<td>5</td>
</tr>
<tr>
<td>Square to the axle-tree</td>
<td>3</td>
</tr>
<tr>
<td>Opening at the axle-tree</td>
<td>24</td>
</tr>
<tr>
<td>Length to the axle-tree</td>
<td>32-5</td>
</tr>
<tr>
<td>Breadth before</td>
<td>5</td>
</tr>
<tr>
<td>Thickness</td>
<td>4</td>
</tr>
<tr>
<td>Fore-guide</td>
<td></td>
</tr>
<tr>
<td>Length from the straight part</td>
<td>20</td>
</tr>
<tr>
<td>The length from the axe-tree to the hind end</td>
<td>28</td>
</tr>
<tr>
<td>To receive the tongue</td>
<td>19</td>
</tr>
<tr>
<td>Near the axle-tree</td>
<td>40</td>
</tr>
<tr>
<td>Behind</td>
<td>50</td>
</tr>
<tr>
<td>The length of the sweep-bar</td>
<td>3-5</td>
</tr>
<tr>
<td>The breadth of do</td>
<td>2-5</td>
</tr>
<tr>
<td>The height or depth of do</td>
<td>144</td>
</tr>
<tr>
<td>The length of each rae</td>
<td>2-2</td>
</tr>
<tr>
<td>The breadth of do</td>
<td>2-2</td>
</tr>
<tr>
<td>The height of do</td>
<td>15-5</td>
</tr>
<tr>
<td>The length of each rae</td>
<td>2-5</td>
</tr>
<tr>
<td>The breadth of do</td>
<td></td>
</tr>
<tr>
<td>The thickness of do</td>
<td>67</td>
</tr>
<tr>
<td>The length of the straight part</td>
<td>10</td>
</tr>
<tr>
<td>The breadth of shaft bar</td>
<td>3-2</td>
</tr>
<tr>
<td>Before</td>
<td>5</td>
</tr>
<tr>
<td>The thickness of shaft bar before</td>
<td>3-2</td>
</tr>
<tr>
<td>Opening</td>
<td></td>
</tr>
<tr>
<td>At the shaft bolt</td>
<td>15</td>
</tr>
<tr>
<td>At the fore shaft-bar before</td>
<td>21</td>
</tr>
<tr>
<td>In the middle</td>
<td>30-5</td>
</tr>
<tr>
<td>Before</td>
<td>24</td>
</tr>
<tr>
<td>The breadth of each shaft-bar</td>
<td>3</td>
</tr>
<tr>
<td>The thickness of do</td>
<td>2</td>
</tr>
<tr>
<td>The length of the tongue</td>
<td>17</td>
</tr>
<tr>
<td>The breadth of do</td>
<td></td>
</tr>
<tr>
<td>The breadth of do</td>
<td></td>
</tr>
<tr>
<td>The height of do</td>
<td></td>
</tr>
<tr>
<td>Distance from the bottom, where the axe-tree passes through the fixed pieces</td>
<td></td>
</tr>
<tr>
<td>The height of the roof</td>
<td>12</td>
</tr>
<tr>
<td>The length of the lids or sides</td>
<td>88</td>
</tr>
<tr>
<td>The breadth of do</td>
<td>10</td>
</tr>
</tbody>
</table>

**Carriage.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>The breadth of do</td>
<td>3-6</td>
</tr>
<tr>
<td>The thickness of do</td>
<td>3</td>
</tr>
<tr>
<td>The length of the guide-bar</td>
<td>50</td>
</tr>
<tr>
<td>The breadth of do in the middle</td>
<td>3</td>
</tr>
<tr>
<td>The breadth of do at the end</td>
<td>1-5</td>
</tr>
<tr>
<td>The thickness of do</td>
<td>1-5</td>
</tr>
<tr>
<td>The distance from the centre of one axe-tree to that</td>
<td>89</td>
</tr>
<tr>
<td>of the other</td>
<td></td>
</tr>
<tr>
<td>The sommers reach</td>
<td></td>
</tr>
<tr>
<td>Beyond the fore axle-tree</td>
<td>10</td>
</tr>
<tr>
<td>Beyond the hind</td>
<td>58</td>
</tr>
</tbody>
</table>

The iron-work of such a wagon.

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pintle</td>
<td>1</td>
</tr>
<tr>
<td>Pole pin</td>
<td>1</td>
</tr>
<tr>
<td>Boller-pins with keys</td>
<td>4</td>
</tr>
<tr>
<td>Locking-plates</td>
<td>2</td>
</tr>
<tr>
<td>Bolt flanges</td>
<td>16</td>
</tr>
<tr>
<td>Sweep-bar pins</td>
<td>2</td>
</tr>
<tr>
<td>Shaft-bolt with key</td>
<td>2</td>
</tr>
<tr>
<td>Swing-tree pins</td>
<td>2</td>
</tr>
<tr>
<td>Hooks for do</td>
<td>2</td>
</tr>
<tr>
<td>Bars for fixing the swing-tree to the axle-tree</td>
<td>2</td>
</tr>
<tr>
<td>Plate for the cross-bar of the fore-guide</td>
<td>1</td>
</tr>
<tr>
<td>Walking-plates for the shafts</td>
<td>2</td>
</tr>
<tr>
<td>Boller bands</td>
<td>4</td>
</tr>
<tr>
<td>Pole plate</td>
<td>1</td>
</tr>
</tbody>
</table>

With iron complete for the shafts, axles-trees, and the wheels, the dowledges excepted.

**Powder carts, or carriages, are for carrying powder along with the army.** Each of them is divided into four parts, by boards of an inch thick, which enter about an inch into the shafts. Only four barrels of powder are flowed in one of these carts. The roof of such a cart is covered with oil-cloth, to prevent dampness from getting to the powder, and its dimensions are the following: See figs. 53 and 54.

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>The diameter of each wheel</td>
<td>65</td>
</tr>
<tr>
<td>The total length of each side with its shaft</td>
<td>180</td>
</tr>
<tr>
<td>Distance from the hind end to the cross-bar</td>
<td>5-3</td>
</tr>
<tr>
<td>Distance from the hind cross-bar to the fore cross-bar</td>
<td>89-5</td>
</tr>
<tr>
<td>Distance from the fore cross-bar to the fore-end</td>
<td>77-5</td>
</tr>
<tr>
<td>Breadth</td>
<td></td>
</tr>
<tr>
<td>At the fore cross-bar</td>
<td>4-4</td>
</tr>
<tr>
<td>In the middle</td>
<td>3-7</td>
</tr>
<tr>
<td>Before</td>
<td>2-8</td>
</tr>
<tr>
<td>Height</td>
<td></td>
</tr>
<tr>
<td>At the fore cross-bar</td>
<td>4</td>
</tr>
<tr>
<td>Before</td>
<td>2-8</td>
</tr>
<tr>
<td>The opening behind and at the fore cross-bar</td>
<td>3-4</td>
</tr>
<tr>
<td>The opening at the middle</td>
<td>3-3</td>
</tr>
<tr>
<td>The opening before</td>
<td>2-8</td>
</tr>
<tr>
<td>Two shaft cross-bar</td>
<td></td>
</tr>
<tr>
<td>Breadth</td>
<td>3</td>
</tr>
<tr>
<td>Height</td>
<td>3</td>
</tr>
<tr>
<td>Length of each</td>
<td>40</td>
</tr>
<tr>
<td>Under cross-bars</td>
<td></td>
</tr>
<tr>
<td>Breadth</td>
<td>3</td>
</tr>
<tr>
<td>Height</td>
<td>2</td>
</tr>
<tr>
<td>The length of each side piece</td>
<td>100</td>
</tr>
<tr>
<td>The breadth of do</td>
<td>13</td>
</tr>
<tr>
<td>The height of do</td>
<td>3</td>
</tr>
<tr>
<td>Distance from the bottom, where the axe-tree passes through the fixed pieces</td>
<td></td>
</tr>
<tr>
<td>The height of the roof</td>
<td>12</td>
</tr>
<tr>
<td>The length of the lids or sides</td>
<td>88</td>
</tr>
<tr>
<td>The breadth of do</td>
<td>10</td>
</tr>
</tbody>
</table>
The thickness of do.  
The length of the roof-sides or lids  
The breadth of do.  
The thickness of do.  
And the iron work is the following:  
A. Side bolts with screws  
B. Cross bolts with angle keys  
C. Double hinges on the flat lids  
D. Staples and keys with chains  
E. Hinges for roof-lids  
F. Hapls, flaps, and keys for do.  
G. Axle-tree pins with keys.  
With irons complete for shafts, wheels and axle-tree.  

A fling wagon is an artillery carriage for moving mortars and heavy guns, from one place to another, at no great distance.  
The following are the dimensions of one: see figs. 55, 56, 57, and 58.  

<table>
<thead>
<tr>
<th>Side-pieces</th>
<th>Length</th>
<th>Breadth</th>
<th>Opening</th>
<th>Exceed axle-tree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>152</td>
<td>7.8</td>
<td>32</td>
<td>15</td>
</tr>
</tbody>
</table>

The height of the centre of the axe-trees 123  
The length of each fore-wheel 43  
The length of its nave 14  
The diameter of the body of do. 13  
The breadth of the middle of do. 14  
The do. of the linch of do. 15  
The breadth of each of its felloes 3.8  
The height of do. 5.5  
The breadth of each of its spokes 3.5  
The thickness of do. 3.5  
The length of the hind-wheel 68  
The length of its nave 17  
The diameter of the body of do. 16  
The do. of the middle of do. 17  
The do. of the linch of do. 13  
The breadth of each of its felloes 13  
The height of do. 4.4  
The breadth of each of its spokes 2.3  
The thickness of do. 4  
The length of the fore axle-tree 75.5  
The length of the body of do. 41.5  
The breadth of the body of do. 8  
The height of the body of do. 5  
The length of each arm of do. 5  
The diameter of the body of each 3  
The do. of the linch of do. 3  
The length of the hind axle-tree 41  
The length of the body of do. 41  
The breadth of do. of do. 5  
The height of do. of do. 7  
The length of each of its arms 20  
The diameter of the body of each 5  
The diameter of the linch of each 4  
The length of the fore boiler 41.5  
The breadth of do. 5  
The height of do. 12  
The length of the hind boiler 51  
The breadth of do. 11  
The length of the rider 54  
The breadth of do. 5  
The height of do. 7.2  

Vol. VI.
Round-headed nails to fallen the crofs bars — 4
Bolts with fcrews to fallen the checks — 7
Iron-work complete for shafts and wheels.

The French have been in the practice of using gun carriages on board their ships, or of having their affuts de marins with only two fore trucks, or roulettes pleines, to each, instead of ordinary wheels. Thofe carriages do not recoil so much as thoife with four trucks, and are rather more eafily pointed.

Their garrison carriages ufed to be conftructed a good deal in the fame manner. But the trucks were made considerably larger than thoife of their ship carriages, and confifted each of fix or more pieces. They had also trails like travelling carriages, but much shorter.

Beforef, they have travelling carriages, or affuts a rouage. Each of thefe consift of two long checks of chn, rounded and shaped nearly as thoife of one of our own travelling carriages, and like them are fastened or joined together by means of four oak tranfoms, called by the French entretoifes; the firft of them, or bract tranfom, they call entretoife de voles; the fefcond, entretoife de touche; the third, entretoife de mire; and the fourth, which runs the whole length of the trail, or of thoife parts of the checks that touch or reft on the ground, entretoife de lanette. When fuch a carriage with its guns is to be moved, a timber, or avant tran, is fastened to the trail of it.

Fig. 61. is an elevation in profile of one check of the travelling carriage called l'affut du capitaine Espagnol, representing the relative dimensions of the different parts.

The figure that follows represents the relative or proportional heights or depths of the checks of carriages for the five calibers of 2, 16, 12, 8, and 4 pounds, according to the French ordinance or regulation of 1732.

<table>
<thead>
<tr>
<th>Proportional height, &amp;c. of each check of a 24 pounder carriage.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do. of a 16 pounder.</td>
</tr>
<tr>
<td>Do. of a 12 pounder.</td>
</tr>
<tr>
<td>Do. of an 8 pounder.</td>
</tr>
<tr>
<td>Do. of a 4 pounder.</td>
</tr>
</tbody>
</table>

Carriage, in Rural Economy, in the practice of irrigation, a fort of conduit made of timber or brick; if of the latter, an arch is turned over the fream that runs under it, and the fides are bricked up; if of the former, which is commonly the cafe, it is conftructed with a bottom and two fides, as wide and as high as the main it lies in. It muff be made very strong, close, and well jointed. Its use is to convey the water in one main over another, which runs at right angles with it; its depth and breadth are of the fame dimensions with the main it belongs to; its length in proportion to the breadth of the main it croffes. Wherever it is neceffary, it is the most efpeotive conveyance belonging to the watering of land. See Irrigation, and Watering of Land.

Carriage Drain, a term applied to a fauro or trench, for the conveying of water to overflow and improve meadow land. Drains of this kind are diftinguifhed into two forts: the main carriage, which fhould be made with a convenient defcent; and the lefter carriage, which fhould be shallow, and as many in number as pofible. Much in the wa-

Carrick, a village in Ireland, this conftructed a good deal in the fame manner. But the trucks were made considerably larger than thoife of their ship carriages, and confifted each of fix or more pieces. They had also trails like travelling carriages, but much shorter.

Besides thefe, they have travelling carriages, or affuts a rouage. Each of thefe consift of two long checks of chn, rounded and shaped nearly as thoife of one of our own travelling carriages, and like them are fastened or joined together by means of four oak tranfoms, called by the French entretoifes; the firft of them, or bract tranfom, they call entretoife de voles; the fefcond, entretoife de touche; the third, entretoife de mire; and the fourth, which runs the whole length of the trail, or of thoife parts of the checks that touch or reft on the ground, entretoife de lanette. When fuch a carriage with its guns is to be moved, a timber, or avant tran, is fastened to the trail of it.

Fig. 61. is an elevation in profile of one check of the travelling carriage called l'affut du capitaine Espagnol, representing the relative dimensions of the different parts.

The figure that follows represents the relative or proportional heights or depths of the checks of carriages for the five calibers of 2, 16, 12, 8, and 4 pounds, according to the French ordinance or regulation of 1732.

<table>
<thead>
<tr>
<th>Proportional height, &amp;c. of each check of a 24 pounder carriage.</th>
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<tr>
<td>Do. of a 16 pounder.</td>
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<tr>
<td>Do. of a 12 pounder.</td>
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<tr>
<td>Do. of an 8 pounder.</td>
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<tr>
<td>Do. of a 4 pounder.</td>
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Carriage, in Rural Economy, in the practice of irrigation, a fort of conduit made of timber or brick; if of the latter, an arch is turned over the fream that runs under it, and the fides are bricked up; if of the former, which is commonly the cafe, it is conftructed with a bottom and two fides, as wide and as high as the main it lies in. It muff be made very strong, close, and well jointed. Its use is to convey the water in one main over another, which runs at right angles with it; its depth and breadth are of the fame dimensions with the main it belongs to; its length in proportion to the breadth of the main it croffes. Wherever it is neceffary, it is the most efpeotive conveyance belonging to the watering of land. See Irrigation, and Watering of Land.

Carriage Drain, a term applied to a fauro or trench, for the conveying of water to overflow and improve meadow land. Drains of this kind are diftinguifhed into two forts: the main carriage, which fhould be made with a convenient defcent; and the lefter carriage, which fhould be shallow, and as many in number as pofible. Much in the wa-

Carrick, the name of some towns, pa-

}
Carrickfergus, or little Carrick, which has some ruins, especially of an old abbey. A belfry erected on one of the side walls of the church, is accounted a great curiosity. It projects about two feet over the wall, from which it takes its site at a point twenty feet from the ground.

This town is mentioned by the abridge of Camden, in 1701, and called Carrick-mac-Griffin, but it is only of late years it has attained its present consequence. Its distance from Dublin is 75 Irish miles S. by W. N. lat. 52° 20'. W. long. 7° 26'. Beaufort. Smith, &c.

CARRICKAMACHIN after, a cluster of small islands and rocks off the coast of the county of Galway, Ireland, a few miles north of the Isles of Arran. N. lat. 53° 13'. W. long. 6° 43'. McKenzie. Beaufort.

CARRICKAREDE. See Ballintoy.

CARRICKFERGUS, Craighour, Knockfergus, i.e. the Rock of Fergus, a market and port town of the county of Antrim, Ireland, on the northern shore of Carrickfergus Bay, or, as it is now usually called, Belfast Lough. It was an early settlement of the English, and was deemed a place of great importance. In 1232, Hugo de Lacy, Earl of Ulster, founded a monastery there, in the precincts of which he was buried a few years after. In the 14th century, when Edward Bruce invaded Ireland, his brother King Robert landed near Carrickfergus, and besieged the castle; which held out so long that the garrison were reduced to the necessity of eating leather, and furnished only through want of food. In the reign of Henry the Seventh, this castle was one of those which an act of Parliament declared ought to be only entrusted to Englishmen. It was not, however, till the government of Sir H. Sydney, in the reign of Queen Elizabeth, that the adjoining town, the trade of which had become considerable, was surrounded with walls, and it was then made a corporation and endowed with many privileges. On the division into counties, a large district was allotted to it, and it still has a separate jurisdiction. The mayor was also made admiral of the coast of Antrim and Down, and certain duties were paid to the corporation of Carrickfergus by vessels going to any of the little neighbouring ports, excepting Bangor and Belfast. This privilege was purchased in the administration of Lord Strafford, and the customs-house transferred to Belfast. See Belfast. Lord Chichester, ancestor of the present marquis of Donegal, having purchased the grant of the monasteries at Carrickfergus about the year 1610, built a castle which was esteemed splendid in those days; but his attention seems to have been chiefly directed to the improvement of Belfast. Carrickfergus, however, continued a place of strength, and as such was taken possession of by general Monk, on behalf of the Parliament of England. In the year 1660, it was the landing place of King William; but though it continues to have a governor regularly appointed, its fortifications have been neglected and decay. In 1759, Thurot, an adventurer, who commanded a small French squadron, ventured to land here, and took hostages for the ransom of the town, but he was soon obliged to retire, and his ships were taken or destroyed by the English. Carrickfergus is the seaport of the county of Antrim, and sends one representative to the Imperial Parliament. It is distant 88 Irish miles N. from Dublin, and 8 N. E. from Belfast. N. lat. 54° 45'. W. long. 5° 42'.

CARRICKHOULT, a bay or anchorage on the county of Clare side of the river Shannon, Ireland, near its mouth. This bay has clear ground, and good anchorage between Carrickhoul cattle and Kiladarran points. N. lat. 52° 37'. W. long. 9° 36'. Mackenzie.

CARRICKMACROSS, a market and port town of the county of Monaghan, Ireland, near the boundary of the county of Louth. From its being mentioned by St. Brelidil, it must be a place of antiquity, but does not appear to have been of much consequence. It is now an improving town, and a vein of good coal discovered near it will probably contribute to the establishment of some manufacture, especially as there is plenty of water, and a possibility of obtaining water carriage to Dundalk at no great expense. It is 41 Irish miles N. by W. from Dublin. N. lat. 53° 52'. W. long. 6° 43'.

CARRIER, a person who undertakes to convey persons, goods, papers, money, or the like, from place to place, on condition of a certain price, either fixed by authority or custom, or left to private agreement. See Carriages.

In Holland carriers are called koeriers, because they always keep the same road, or route; setting out, and arriving at fixed hours.

All persons carrying goods for hire, as masters and owners of ships, lightermen, flag-coachmen, (but not hackney-coachmen in London) and such like, are legally comprehended under the denomination of common carriers, and are chargeable on the general custom of the realm for their faults or miscarriages. See Bailment. In an action on the case against the master of a flag-coach, it was adjudged that he was not chargeable (e.g. for a trunk lost) unless the master takes a price for the carriage of the goods as well as for the carriage of the person, in which case he is within the custom as a carrier; but by the custom and usage of the ages, every passenger pays for the carriage of goods above a certain weight; and then the coachman shall be charged for the loss of goods beyond such weight. If a common carrier loses goods which he is entrusted to carry, a special action in the case lies against him, on the custom of the realm; and fo of a common carrier by boat. 1 Rol. Abr. 6. An action will lie against a porter, carrier, or bargeman, upon his bare receipt of the goods, if they are lost by negligence. 1 Sid. 36. Also, if a lighterman spoils goods which he is to carry, by letting water come to them, an action on the case lies against him on the common custom. Palm. 528. If a carrier entrusted with goods opens the pack, and takes away any part of its contents, he is guilty of felony. H. P. c. 61. And it is the same also if a carrier receives goods to carry them to a certain place, and carries them to some other place, with intent to defraud the owner. 3 Inst. 607. If a common carrier, having convenience and being offered his hire, refuses to carry goods, he is liable to an action. 2 Show. Rep. 327. But he may refuse to admit goods into his warehouse at an unreasonable time, or before he is ready to take his journey. Lord Raym. 652. A common carrier may have action of trover or trespass for goods taken out of his possession by a stranger; and where goods are stolen from a carrier, he may bring an indictment against the felon, and as for his own goods; and the owner may likewise prefer an indictment against the felon. Kil. 79. By lat. 3 Car. 1. c. 1. carriers are not to travel on the Lord's day or part of 528. By 3 W. and M. c. 13. the justices are annually to affect the price of land carriage of goods that are to be brought into any place within their jurisdiction by any common carrier, who is not to take more, under the penalty of 5l. And by 21 Geo. II. c. 28, § 2, a carrier is not to take more for carrying goods from any place to London than the justices have settled for the carrying of goods from London to such a place, under the same penalty. This act of 21 Geo. II. c. 28, stands repealed by 7 Geo. III. c. 40. so much of it excepted as relates to the price or rate for carriage of goods; and the 7 Geo. III. c. 40. (except so much as repeals the several acts within-mentioned) was repealed by 13 Geo. III. c. 78. § 83. By 24th Geo. II. c. 8 § 9. commissi-
fioners for regulating the navigation of the river Thames are to rate the price of water-carriage; and by 32 Geo. II. c. 22. § 3. Justices of the city of London are to assist in the rates of carrying goods between London and Westminster. By 13 Geo. III. c. 78. carriers and waggoneers are to write or paint on their waggons or carts their names and places of abode; and the owner of every common flage, waggon, or cart, traveling from town to town, shall paint "common flage waggon or cart," as the case may be, under the pain of forfeiting not more than 3l. nor less than 2s.

At common law a carrier is liable by the custom of the realm to make good all losses of goods entrusted to him to carry; except such losses as arise from the act of God, or inevitable accident; from the act of his enemies; and from the default of the party sending them. 1 Inf. 89. 2 Lord Raym. 909. Esq. N. P. 619. But, in order to charge the carrier, the following circumstances are to be observed. 1. The goods must be lost while in the possession of the carrier himself, or in his sole care. 2. The carrier is liable only so far as he is paid, for he is chargeable by reason of his reward. 3. Under a special or qualified acceptance the carrier is bound no further than he undertakes; and, therefore, it seems safest, that in all instances of sending things of value by a carrier, the carrier should have notice and be paid accordingly. 4. A delivery to the carrier's servant is a delivery to himself, and shall charge him; but they must be goods, such as it is his custom to carry, not out of his line of business. 5. Where goods are lost, which have been sent on board a ship, the action may be brought either against the master or against the owner. 2 Salk. 282. 5. Where goods are lost, which have been sent on board a ship, the action may be brought either against the master or against the owner. 2 Salk. 450. 6. It is not necessary in order to charge the carrier that the goods are lost in transit, while immediately under his care; for he is bound to deliver them to the consignee, or fend notice to him according to the direction; and though they are carried safely to the inn, yet if lost there till they are spoiled, and no notice given to the consignee, the carrier is liable. 3 Wil. 429. 2 Bl. Rep. 916. Jacob's Dict. by Tomlins.

Carrier pigeon, a sort of pigeon used, when properly trained up, to be sent with letters from one place to another. This is the Columba Tabellaria of the Linnean System.

It is larger in size than most of the other kinds. Its length from the tip of the beak to the end of the tail being often fifteen inches; but its greatest weight not twenty ounces. Its flesh is firm and its feathers close; it is long-necked, and of a better shape than most other pigeons. The upper chap of the bill is half covered from the head with a white or blackish tuberous furfurance flesh, which projects or hangs over both its sides, on the upper part nearest the head, and ends in a point about the middle of the bill. This is called the bowl. The eyes are surrounded with the same sort of corrugated flesh for the breadth of a filling, and their iris is red. Their beak is long, straight, and thick; their wattle generally broad across the back; short from the head toward the point, and tilting forward from the head; and the head narrow, long, and flat; the neck very long and thin, and the breast broad; the feather is chiefly black or dun, though there are blues, whites, and pyed.

It has its name from its remarkable sagacity in returning to the place where it was bred, though carried to great distances; from which property it was made use of to carry letters to distant places, as a speedy and safe method of conveyance.

They were trained to this method in Turkey and Persia, and were carried first, while young, short flights of half a mile, and afterwards more, till at length they would return from the farthest part of the kingdom. Every basbaw had a basket of these pigeons, bred at the feraglio, which, upon any other occasion, as an insurrection, or the like, he dispatched with letters, braced under their wings, to the feraglio, only sending out more than one, for fear of accidents. Lightow affirms, ush one of these birds would carry a letter from Babylon to Aleppo, which is thirty days journey, in forty-eight hours. This pigeon was employed, in former times, for carrying intelligence from Scanderoon, of the arrival of the Company's ships; in that part, the name of the ship, the hour of her arrival, and whatever else could be comprized in a small compas, being written on a slip of paper, which was secured in such a manner under the pigeon's wings as not to impede its flight; and her feet were bathed in vinegar, with a view to keep them cool, and prevent her being tempted by the sight of water to alight, by which the journey might have been prolonged, or the bill lost. The pigeons performed this journey in 2½ hours. The messenger had a young brood at Aleppo, and was sent down in an uncovered cage to Scanderoon, from whence, as soon as set at liberty, he returned with all possible expedition to his seat. At the season of the arrival of the annual ships, it was usual to send pigeons to be ready at the port. Some have affirmed that the pigeon was at once sent down to Scanderoon in a cage; but others with greater probability affirm, that she was taught by degrees to fly from shorter distances on the Scanderoon road. It is also said, that the pigeons, when let fly from Scanderoon, instead of binding their course towards the high mountains surrounding the plain, mounted at once directly up, soaring still almost perpendicularly till out of sight, as if to survey at once the obstacles intercepting their view of the place of their destination.

The custom of carrying on a correspondence between Aleppo and Scanderoon by means of pigeons was common in M. D'Arvieux's time. Mem. T. 105. 456. Maillet, in his "Description de l'Egypt," vol. ii. p. 271, has given a very circumstantial account of this mode of conveying intelligence; and he also relates a story of a pigeon dispatched from Aleppo to Scanderoon, which, mistakes its way, was absent for three days, and in that time had made an excursion to the island of Ceylon; a circumstance then deduced from finding green cloves in the bird's stomach, and credited at Aleppo. Baumgarten mentions the flying of pigeons in his time (164) in Egypt. Sir John Mandeville also mentions it in his Travels. In the time of the holy war, certain Saracen ambassadors who came to Godfrey of Antioch from a neighbouring prince, sent intelligence to their master of the success of their embassy, by means of pigeons, fixing the billet to the bird's tail. Bochart has collected numerous authorities for the antiquity of this custom both in Syria and Greece, (vol. ii. p. 155) and more respecting its antiquity may be found in Pennant's British Zoology. Hirtius and Bruns, at the siege of Modena, held a correspondence with one another by means of pigeons. And Ovid tells us, that Tarsotheces, by a pigeon painted with purple, gave notice to his father of his victory at the Olympic games, sending it to him at Ashina. Allain. Var. Hist. lib. ix. cap. 2. Phily. lib. x. cap. 24. Anacreon tells us, that he conveyed a billet-doux to his beautiful Bathyllis, by a dove. Ode 9. The use of pigeons, as couriers between Aleppo and Scanderoon, and also Bagdad, has been discontinued for the last 40 or 50 years, because the Cerd robbers killed the pigeons. See Dragoon and Horseman.

CARRIERA, Rosalba, in Biography, an eminent female painter, was a native of Chiozza, in the Adriatic, where she was born, in 1655; and being deified of personal charms, she gave scope to her mental abilities. Having manifested an early taste for painting, her father procured for
for the instruction of an artist, from whom she learned to paint full size in oil; but afterwards succeeding in miniatures, she confined herself to this branch of the art, and carried crayon painting to a high degree of perfection. Her portraits, spread all over Europe, are as elegant and graceful in conception and attitude, as they are fresh, neat, and alluring in colour. Her Madonna, and other religious subjects, blend dignity, and even majesty, with grace. Her reputation was very widely extended; and whilst the exhibited specimens of her skill in Italy, at Paris, and Vienna, she received distinguished marks of respect and esteem. She lived with distinction in her native country, and her works were eagerly sought by the curious in distant nations. Recovery暹生后energized her against during the last ten years of her life. She combined music with painting; and at the advanced age of 82 years, closed her life, in 1757, after having amassed considerable property of her own acquisition, D'Argenville. Pilkington, by Publ. •

CARRIERE. See Carre.

CARRION, in Geography, a river of Spain, which joins the Pisuerga, near Viana.

Carrion de los Condes, a town of Spain, seated on the river Carrion, in the province of Leon, on the frontiers of Old Castrale; containing 10 parish churches, 10 convents, and 2 hospitals; 14 leagues W. of Burgos.

CARRONLISTA, in the Ancient Military Art, denotes a species of ballista, mounted on wheels, and drawn by horses; by which it differed from the manuballista, which, being lighter and lighter, was thrown by the hand.

CARROCIUM, or Carrocerum, in Middle Age Writers, denotes the banner, or chief flag of an army, which was mounted on a kind of chariot, and drawn by oxen.

CARRUCK, in Geography, a mountain of England, in the county of Cumberland, 2205 feet above the level of the sea.

CARRODUNUM, in Ancient Geography, a town of Germany, according to Ptolemy, supposed to be the present Radam, in the palatinate of Saxony. — Alto, a town of Waudheia, supposed to be the present Gramberg, on the Inn. — Alto, a town of Upper Pannonia, which the interpreters of Ptolemy suppose to be the present Carnberg, on the banks of the Raba. — Alto, a town of European Sarmatia, seated on the river Tyras. Ptolemy.

CARRON, a river of Wales, which runs into the sea, about 4 miles S.W. from Caernarvon.

CARRON, a river of Scotland, which runs into the sea, near Stonehaven, in the county of Kincardine. — Alto, a small river of Scotland, which rises about the middle of the isthmus between the friths of the Forth and Clyde, and, after a course of about 14 miles, dividing the county of Stirling into two nearly equal parts, falls into the Forth, three miles E. from the Carron works, in the county of Stirling. This river seems to have been the boundary of the Roman province in North Britain; Antonius's wall being in the vicinity of this river, and running parallel to it for several miles. This opinion is rendered probable by the situation of "Arthur's Own," as it is called, which is supposed to have been a temple dedicated to Terninus, and erected near the Roman frontier. It stood on the west side of the river Carron, or between that river and Kinnaird. The moats of Kinnaird, which was without doubt formerly united to that of Foulis, is distant only one mile and a half from the river, and the moats of Kincardine are only twelve miles distant from the flatton at Camelon. Forests, therefore, in either of these places, would have afforded very convenient refuge to the Caledonians, whether they were making incursions into the Roman province, or haraizing the Roman armies in their expeditions towards the north.

Besides, that a people more civilized than the ancient Caledonians must have been in this country before the moat of Kincardine existed, is completely established by the discovery of a road on the surface of the clay at the bottom of that moat, after the peat, to the depth of eight feet, had been removed. The direction of this road is from the Forth across the moat towards a road, supposed to be Roman, which passes between the moat and the river Tenth. These roads probably communicated, and were parts of the military works of the Romans, and designed for the use of the troops employed to repel the incursions made by the Caledonians from the mountains into the Roman province. A passage in Herodotus favours the opinion here advanced. That historician (lib. iii. cap. 48) mentions the army of Seveus passing "in prosouskisoj rixovia ti kai karyma ti Pavora orafe." He adds, that on this frontier the Barbarians usually made their escape, "and concealed themselves in the thickets and marshes." Edinb. Trans. vol. iii. p. 276. Near the middle of the course of this river, in a pleasant valley, stand two beautiful mounts, called the "hills of Dunipace," which are now planted with firs, and between which is seated the church of Dunipace. Tradition reports, that these mounts were raised as monuments of a peace concluded in that place between the Romans and Caledonians, and that their name is compounded of the language of both people; dum, signifying a hill in the old language of this island, and pace, peace, in the language of Rome: to that Dunipace denotes the "hills of peace." Others, however, have supposed that they are sepulchral monuments, which is an opinion, not improbable. See Barrow. As this river runs to the boundary of the Roman province, if it be not itself the precise boundary, the adjacent country must unavoidably be the scene of many encampments and battles. Accordingly, historians mention a bloody battle fought near this river between the Romans ad the confederate army of the Scots and Picts in the beginning of the 5th century; and the translator, or the author, of Ossian's poems lays the scenes of some of them upon the banks of this river. About the distance of half a mile from the river, and near the town of Falkirk, lies the field of that battle which was fought by William Wallace and the English, in the beginning of the 14th century. It bears the name of "Graham's Muir," from the valiant John Graham, who fell there, and whose grave-stone is still to be seen in the church-yard of Falkirk.

Carron, a village of Scotland, in the county of Stirling, seated on a river of the same name; celebrated for its extensive iron forges; two miles N. of Falkirk, and three miles above the entrance of the Carron into the frith of Forth. The river is navigable for some miles from its mouth, and a considerable trade is carried on upon it by small craft; for the convenience of which its channel has of late years been straightened and much shortened, and the great canal is connected with it by a cut and lock. See Forth and Clyde Canal. The Carron ore is described by Mr. Kirwan, (Miner. vol. ii. p. 174.) as being an argillaceous stone, of a bluish grey, internally of a dark ochre yellow. It is found in flatly mafies, and in nodules, in an adjacent coal-mine, of which it sometimes forms the roof. At the Carron works, this ore is often smelted with the red greasy iron ore from Ulverton, in Lancashire, which imparts calfer fusion, and superior value. These works, which have attained such distinguished celebrity, were first established principally under the direction of Dr. Roebuck, an ingenious chemist and physician of Birmingham, and by means of a capital furnished by his relations and friends, as well as those of his associate Mr. Garret, in addition to their own. After a careful and minute comparison of the advantages and disadvantages of different situations in Scotland, he made choice of
of a spot, on the banks of the river Carron, as the most advantageous situation for the establishment of the proposed iron manufacture. There he found they could easily command abundance of water for the necessary machinery, and in the neighbourhood of it, as well as every where along both the north and south coasts of the Firth, were to be found inexhaustible quarries of iron stone, lime-stone, and coal. From Carron also, they could easily transport their manufactures to different countries by sea. The communication with Glasgow, at that time, by land-carriage, which opened to them a ready way to the American market, was short and easy. To aid him in the execution of his undertaking, he engaged the co-operation of Mr. Smatton, then the first engineer in England, and also of Mr. James Watt, then of Glasgow; but latter known for his inventive genius in the mechanic arts, both in Scotland and England. The necessary preparations for the establishment of the iron-works at Carron were made within the close of the year 1759; and on the first of January, 1760, the first furnace was blown; and in a short time afterwards a second was erected. See the article ROEBUCK. For the extension and improvement of this foundry, about 120 acres of land have been converted into ironworks and pools, for water diverted from the river Carron, by magnificent dams built about two miles above the works, which, after turning 18 large wheels for the several purposes of the manufacture, falls into a tide-navigation that conveys its produce to the sea. For a further account of the machinery of these works, the number of its furnaces, the annual amount of iron melted, &c. &c. see BLAST Furnace. See also CANNON. The present proprietors of this foundry are a chartered company, with a capital of 150,000l. stabling, a common hall, &c.; but their flock is confined to a few individuals.

CARRONADE, in the MILITARY ART. See CANNON.

CARRON, in Geography, a town and port of Hinde-foftan, in the country of Mylcor, and province of Comberton, seated on the Ambrevetcy; evaded by the troops of Tippoo Sultan, on the 15th of June, 1790, when general Meadows, commander of the British forces, took possession of it, and made it a depot for provisions; 38 miles W. of Trichinopoly. N. lat. 10° 57'. E. long. 78° 52'.

CARROT, in Botany. See Daucus carota.

Carrot, in Gardening. See Dauccus.

Carrot, in Husbandry, is a large well-known tap-rooted plant, which, at present, is much employed in the feeding of different sorts of live stock; in which view it is a root of considerable utility and importance to the farmer. It is, however, only within these few late years that its application in this intention has been carried to any extent in this country. It was probably first introduced into field culture in the southern parts of the island from the Low Countries. There are several varieties of this valuable plant, but that which is the most proper for being cultivated in the field for the above use is that which is usually termed the orange carrot, in which the colour of the root is of a much more dark orange appearance than in any of the others; and, besides, it rice to a much larger size, and is more fac- charming and juicy. See Dauccus.

This sort of crop is capable of being cultivated probably to the greatest advantage on the warm, light, loamy, or sandy soils; but it succeeds well on other kinds, as on gravelly lands. Mr. Young properly remarks, that the proper sort of soil should not be mistaken through common notions, or confused to a compas much within the reality. It is, says he, a general idea, that nothing but sands will do for carrots, but this is a mistake, the best soil for them is a sandy loam, rather light, but moiti, of a great depth; in which there is little difficulty in ploughing to

the very beam of the plough, all the soil brought up being of the same kind, and as fit for vegetation as the surface." But, though he considers this sort of soil as the most perfectly adapted to this kind of crop, "it will, he conceives, thrive to great profit on the heavier loams, but not on wet ones, or clays. On good wheat loams of the gravelly kinds that plough easily they do well. At first light, he supposes, they might, perhaps, be thought too thin; but they will yield large carrots, though the expences of cultivation will run higher in cleaning the ground, &c."

In the preparation of the land for this sort of crop much tillage is by some considered unnecessary: "the best culture of carrots is," says the above author, "to let the barley or wheat stubble lie till you plough and low, putting them in on one earth." But others are inclined to more tillage, and think that on whatever sort of soil this root may be grown, or after whatever kind of crop, the ground should constantly be ploughed as deep as possible in October, a second time in dry weather in February, and a third in March, for the reception of the seeds. By ploughing the land deep in October, two beneficial purposes are, they suppos, answered; the new soil is exposed to the influence of the winter's frosts, by which it is mellowed and rendered more fit for nourishing the plants; and the roots of the carrots are enabled, with more freedom, to push downwards, a circumstance of considerable importance in this kind of husbandry; for, if the roots meet with any obstruction in getting down, they are apt to grow forked, and throw out lateral roots, by which the crop is injured in a very material degree. Mr. Young, however, only conceives the second ploughing in February necessary, in cases when the surface mould is not expected to be in a state of sufficient fineness at the period of sowing. When the last ploughing or feed-furrow in March has been given, the land should be harrowed, and the surface made as fine as possible for the seed to be put in upon.

Though it is not absolutely necessary to make use of manure for this sort of crop, as good carrots may be grown without it, it is plain, from the numerous trials which have been made and recorded in different works, that it is only by the liberal application of it, that the largest quantity of produce can be afforded. Where it is applied it should be turned into the ground in a well-rotted state during the last ploughing in March.

At this period the seed should be sown in an even man- ner over the surface, in the proportion of five pounds to an acre, and harrowed in immediately in a light way. Mr. Young, however, advises, that where the land is sufficiently fine and mellow at the time of ploughing, in February, and proper for being harrowed upon, not to omit sowing upon that ploughing, "for, although March is the common saxon, the uncertainties of the weather are such, that the state of the land, in most cases, requires a greater attention than the name of the month; and carrot seed, let the weather be ever so severe, will take no harm. It may, says he, be sown without danger in November. In case March turns out very wet, and the sowing is driven into April, it is twenty to one that the crop will suffer." About the 25th of March is, however, the time most generally observed in the Suffolk practice.

In regard to the seed, it has been recommended by the author of "Practical Agriculture," for cultivators to be careful in sowing it, by selecting some of the best and most perfectly formed roots annually of the preceding year's growth, and setting them out separately in the beginning or middle of March, in an open piece of ground for the purpose. The seed in this way will be ready in August; by which means the farmer will always be in possession of such good
good fresh feed as may be fully depended upon; which can seldom or ever be the case when it is purchased. As this fort of feeds is liable to adhere or cling close together, it is almost impossible to saw them with any degree of regularity or exactness, without adopting some method of separating them, before they are made use of in the way of feed. With this intention the belt mode is probably that of mixing them with some fort of material that may render them more capable of being dispersed over the land, such as saw-dust, bran, or a light kind of dry land, uniting the whole well by rubbing them together. By this means the feeds may be so disengaged and separated from each other, as to enable the feedman to scatter them with much more evenness over the surface of the ground. There is also another improvement in the culture of this crop, with respect to the feed, which is that of keeping it from one to two days in water, by which it is said, the vegetation of it is greatly forwarded, which is a circumstance of much consequence to the crop.

Though we have seen that five pounds of feed are made use of to the acre in the broad-call method; where the drill plan is followed, two or three pounds may be fully sufficient. The drill of the above modes of fowing is, however, the most commonly practiced, the feed being afterwards lightly harrowed in by a small harrow; and, as it is not much better for being dispersed or delvered with exactness by the drill-machine, and the young plants easily set out to proper distances by the hoe, it is probably the most suitable method of putting in the crop.

The drill plan, notwithstanding, has been attempted in order to lessen the expense of land labour in hoeing the crops by some farmers. In thefe cases, the feed is put in at equidistant rows, at twelve, fifteen, or eighteen inches distance from each other, according to the land and the mode of hoeing that is employed. In some instances drill-machines are not made use of, but the land is ploughed into small drills or furrows by hoes or other implements for the purpose, and then the feed cast over the ground by the hand, and harrowed in lightly, or covered, by hoeing in the tops of the ridgelets, in a light even manner. When a drill machine is employed for this purpose, it is recommended by Mr. Amos to put the feed in to the depth of one inch in the rows, leaving the space of fourteen inches between them as an interval. The feed is prepared by previous steeping and mixing in the manner mentioned above, and the land afterwards harrowed over once in a place, in a light manner.

It is of great consequence that this fort of crop should be properly thinned out while the plants are in their early growth, and kept perfectly free from all sorts of weeds by repeated hoeings. In the first of the, which should be given as soon as the plants can be fully distinguished from the weeds that are about them, the work should be performed with three inch hoes, having handles not more than two feet in length, and be executed with great care and attention, as it is often extremely difficult to distinguish the young carrot plants from the weeds. The second hoeing should be given in a few weeks afterwards, according to the state of the crop, which may be performed with common hoes, and the plants be set out to proper distances. From eight to fifteen or eighteen inches each way are the most usual distances at which they are suffered to stand; and it has been found, from the experience of many years, in districts where they are the most cultivated, that carrots, which grow at such distances, constantly prove a more abundant crop than when the plants are permitted to stand clover together. The third hoeing is mostly given about the middle or towards the end of June, and in this, besides destroying the weeds, another material circumstance to be attended to, is to set out the carrots at proper distances, and also whenever any have been left double at the former hoeings, to take the world of the two plants away, to as to leave the set perfectly clear and free from interruption. When the crop has been put in earlier than the usual period, the first hoeing should, Mr. Young says, be performed in the latter end of April, and when the weather is fine, as much injury may be done in executing it when there is much wet. And where the first hoeing has been given at the above time, the crops should, in the beginning of May, be well harrowed, and have a second hoeing towards the end of it. The harrowing will not, he affirms, "damage the young carrots, nor pull up one in twenty; but it will displace the weeds yet again by rain, and check the growth of those that are got up since." The crops should likewise be looked over towards the latter end of August, and such struggling weeds as may be met with removed. This is more necessary than farmers in general suppose.

The experience of these different hoeings differs considerably in different situations, but is generally from the to the third hoeing, and in some places rather more.

There are differences in the carrot husbandry in different districts. In Suffolk, the farmers sow their after turnips, barley, and peas, set upon a large crop of grass; the crops upon the soil are generally more productive, as next to that they prefer the latter. In the first case they feed off the turnips by the beginning of February, and then lay the land up in small balks or furrows, in which state it remains till the second week in March, when it is harrowed down, and double-harrowed to the depth of about twelve inches, and the feed sown thereon, at the rate of four pounds and a half to the acre. As soon as the plants appear distinctly, they are set out with a small hoe at the distance of six inches from each other; they are afterwards hoed twice at different times, according to the crop seems to require it; and it is not unusual to harrow them between the hoeings, which does no injury to the root, and frequently saves the expense of the third hoeing. When carrots are intended to be sown after peas, they usually plough the stubble as soon as the harvest is over, in order that the land may clear itself of weeds; in December, it is laid up in small balks to receive the benefit of the frosts; in February, it is harrowed down and manured at the rate of fifteen loads per acre; the manure is ploughed in to the depth of about four inches, and in the month of March the land is double-harrowed and the feed sown. By pursuing this method they lay the manure lies in the centre of the fallow, and not only affords nourishment and support to the carrot in its perpendicular progress, but renders it easy to be turned up by a single ploughing, and greatly promotes the growth of the succeeding crop of barley. But in Norfolk, where it is the practice also to sow carrots after a crop of turnips, the manure, after being put on the land in the beginning of March, is first ploughed in with a common plough, and afterwards the land is trench-ploughed about fourteen or fifteen inches deep, and then harrowed very fine, and the feed sown about the middle of March, though the latter end of that month is probably better, as then plants come up early as soon as the early crop, and are attended with fewer weeds. The carrots are in this way generally ready to hoe in the beginning of May, and when tolerably free from weeds, may be hoed with large hoes. Carrots are also frequently grown with the fame preparations on the same land where potatoes have grown. The manner in which Mr. Billing cultivated his land for these plants, is the following: The wheat and clover
Carrot.

Clover stubbles were split down by him with the plough the preceding November, and he is satisfied, that whether the wheat stubble, be, as it is called in Norfolk, flat work, or in ridges, or the carrots are to be sown after clover or rye grais, the land cannot be ploughed too early, so that the frit and snow may have their full effect in mellowing the ground for the reception of so small a seed; and this is the more necessary to be attended to, the fiffer and tougher the foil is. He ploughs the wheat and clover stubble three times, but the land on which the turnips have been, but twice; the first time shallow, but the last as deep as the flap of the ground will permit, and on this ploughing the carrots are sown. Sometimes the land is immediately dug for the carrots, but at other times only for the previous crop; the farmer is probably the better method. Mr. Billing thinks four pounds of seed an acre is sufficiently. It is generally three weeks after sowing, and sometimes longer before the carrots appear, and they are frequently seven or eight weeks before they are fit for the hoe, which affords the weeds an opportunity to get strength in this season, as they grow fast. Mr. Billing is therefore of opinion, that it is better to sow them as late as you can with safety to the crop, as he found those sown in April on clover-stubble, came much the finest to the hoe, though later sown. In this mode where the crop of carrots is very clean, one hoeing may, he thinks, be sufficient; but, where the weeds are strong, it is necessary to hoe them a second time; but about ten days or a fortnight after the first hoeing, they should be harrowed: this will displace the weeds, and prevent their growing again, which many of them will probably other- wise do, especially if it be showery weather. The harrowing does not hurt the carrot plants, as has been observed above, but, on the contrary, does them service, by bringing fresh earth to them, as well as by defloating the weeds. In about three weeks after harrowing where the ground is not cleared, or in cafe new weeds spring up. Mr. Billing hoe the carrots a second time; and after this, if there still remain any weeds, which will be the case if much rain falls during the time of the second hoeing, a third harrowing is indefatigable. But where the weather has been favourable, and those employed in hoeing have done their duty, the carrots once hoed and harrowed have been, he says, as clean as thoae on which two hoeings and as many harrowings have been practised.

It is the remark of an Effex farmer, that carrots will amply repay every expense of the finest culture, and from their extensive utility, on sound, deep, and friable land, be every where attempted. He sows in March or April; hoes three times, and harrows after each hoeing. The expense of cultivating this crop on poor sandy land of five shillings an acre in the Suffolk method, is thus stated.

<table>
<thead>
<tr>
<th>Expenses</th>
<th>£.</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ploughing at 8d.</td>
<td>-</td>
<td>-</td>
<td>3 4 0</td>
</tr>
<tr>
<td>Seed: 45 lbs. at 6d.</td>
<td>-</td>
<td>-</td>
<td>3 7 6</td>
</tr>
<tr>
<td>Sowing</td>
<td>-</td>
<td>-</td>
<td>1 6 0</td>
</tr>
<tr>
<td>Harrowing</td>
<td>-</td>
<td>-</td>
<td>0 8 0</td>
</tr>
<tr>
<td>Hoeing four acres at 2s. and four at 2s.</td>
<td>-</td>
<td>-</td>
<td>9 9 0</td>
</tr>
<tr>
<td>Ditto, second time, eight acres at 10s.</td>
<td>-</td>
<td>-</td>
<td>4 0 0</td>
</tr>
<tr>
<td>Taking up and clearing 4360 bushels at 3s. per</td>
<td>-</td>
<td>-</td>
<td>16 6 9</td>
</tr>
<tr>
<td>land of 30 buflhels</td>
<td>-</td>
<td>-</td>
<td>16 6 9</td>
</tr>
<tr>
<td>Seventy-four days work of one horse, at 2s. 6d.</td>
<td>-</td>
<td>-</td>
<td>9 5 0</td>
</tr>
<tr>
<td>A bailiff for attending the work</td>
<td>-</td>
<td>-</td>
<td>3 0 0</td>
</tr>
<tr>
<td>Farm general expenses, fines 1s. per acre</td>
<td>-</td>
<td>-</td>
<td>0 8 0</td>
</tr>
<tr>
<td>Ditto, hundreys, 1s. per acre</td>
<td>-</td>
<td>-</td>
<td>0 8 0</td>
</tr>
<tr>
<td>Rent, tiches, and rates</td>
<td>-</td>
<td>-</td>
<td>12 0 0</td>
</tr>
<tr>
<td>8l. per acre</td>
<td>-</td>
<td>-</td>
<td>£63 6 0</td>
</tr>
</tbody>
</table>

Produce.

<table>
<thead>
<tr>
<th>£.</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>By 2933 bushels, sold at 7d. and 8d.</td>
<td>92</td>
<td>7 2</td>
</tr>
<tr>
<td>— horses 160 bushels used, to Dec. 20th, saved</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— 7 coombs, 2 bushels of oats</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— saddle horse, 21 at 7d.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— 200 lambs 2 weeks at 2d.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— hogs 54 bushels at 8d.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— 5 cattle on the tops 2 weeks</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— hogs 72 bushels at 7d.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— hogs to Dec. 20th, 60 buflhels</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— Ditto, 158, at 3d.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— horees, 72 at 7d.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— hogs, 1/2 at 8d.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— saddle horse, 15 at 8d.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— hogs 8 at 8d.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— cow, 3 at 8d.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>— 50 bushels half rotten sold for</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Expenses | - | - | £117 10 10 |
Profit | - | - | £54 4 10 |

This is 6l. 13s. 7d. per acre profit, besides the land being left in most excellent order for barley, which fully shews the vast advantage of cultivating this kind of crop whenever the farmer has land capable of admitting it.

Of the advantage of the drill culture there are different opinions, but further trials are necessary. Mr. Amos's method is "two pounds of seed per acre." He stews the seed in rain water twenty-four hours, and lays it upon a floor, until the pears are mixed it thoroughiy, with three pecks of dry sawdust, and three pecks of fine dry mould. Drills one inch deep and fourteen inches between the rows, with the same cups used for wheat or barley. Harrows once in a place. The plants appear in eight or ten days. On exprressing his surprise at seeing good long carrots grown on very shallow lands, to a person who had been many years bailiff to several estates, he told him that he had been accosted to obtain carrots of full length and size, in such land, by dibbling the seed to a great depth, with an iron dibble; and when it was objected, that the plants, from the feed being too deeply buried, would never get above the surface; he assured him, in his numerous trials, he never observed any such consequence.

8 It
It is stated by a writer in the twenty-fourth volume of the Annals of Agriculture, that he sowed broad-cast two acres of carrots, following a potatoe crop, on a light sandy loam of twenty shillings an acre. They were twice hoed, at thirteen shillings the two, in the manner of hoeing cupins; and in the course of the Summer he moved one third of the tops twice; another third of the tops once; and the remaining third of the crop the fecthy did not pass over. The tops were greedily devoured by his horses, cattle, and pigs, in the fold-yard, and were equal in quantity and value to a considerable crop of clover, cut and made use of in the same mode. At the end of October he took up the carrot roots and prepared them in a trench in the manner of potatoes. The crop was full fix hundred bushels per acre; and it was not found that the roots of those carrots whose tops had been twice cut were at all inferior in size or quality to those whose tops had been left untouched. A pastage was left for a small cart to carry off the tops, and another he made by drawing the young carrots wanted for family use. He has reason to consider this mode of cultivating carrots equal to the bell fellow crop, provided the carrots are twice well hoed, and the tops are cut off, as the fecthy prevents any weeds feeding in the autumn. His horses, oxen, milch cows, and pigs, were fed with the carrot roots; his turkeys and other poultry had them in a boiled state, and were fattet well upon them; even his pigeons were fed upon carrots, as they constantly attended in the fold-yard to pick up every particle that dropped from the mouths of the cattle; which supply was sufficient to keep them at home, and to save an expence in feeding them in the severe weather. The market price of carrots near his house, twelve miles east of York, was from tenpence to one shilling a bushel; at which price it must be allowed, he says, that the crop was a profitable one. He further remarks, that the demand for carrots in his neighbourhod for rabbits is not inconsiderable, for it is found that this food is more invigorating and fattening than any other that can be given them.

Though it is a common practice with farmers in Suffolk to allow crops of carrots to remain in the ground all winter, it ought by no means to be generally recommended; as besides the injury the crop may frequently suffer by severe frosts, the farmer must often experience great difficulty in getting up a sufficient quantity of roots for the supply of his live flock, especially when the earth is bound up by frost or covered with snow. On the above grounds it is evident, that the best way of preferring carrots during winter and spring is to dig them up in the end of October, or beginning of November, when their green leaves are decayed, which is a common practice in Leicestershire. In doing this, the best method is to make use of three-pronged forks, though spades are frequently used. By loosening the soil with either of these instruments, and drawing up the carrots at the same time by the tops, the work is performed in a very expeditious manner. The carrots should be allowed to dry a day or two on the field before they are taken home; on being dug up, when they are dry, the tops may be taken off and given to the swine or cattle; and the roots be piled up in heaps in some close dry house, well covered up, either with straw or dry fau, so as to defend them from frost and dampness. Where the busses of taking up the roots is delayed till November, Mr. Young well observes, that in cafe of wet weather they are liable to be much injured. It is observed by an Irish farmer that it is his practice to take them up on a dry day, put them directly into small upright casks of ten bushels each, entirely covered with the tops cut off; they thus appear to dry better than in any other mode; and with very little los, to bear the weather. If after being thus dried, they are carried into any barn, or shed, it will be better, if in large quantities, on account of the hazard of heating, not to pack them close, but rather throw them promiscuously into heaps with a little straw over them. Some however pile them up in a conical manner with a few of the tops hanging down on the outside, and others place them in a ridge of earth in the manner of potatoes.

According to the account of Mr. Arthur Young, in Suffolk, a medium crop may be reckoned at three hundred and fifty bushels the acre, which at fix-pence the buishel, the price at which they are sold to be sent to the London markets, amounts to £1 15s. 9d. the acre. Hence, through the hoeding and digging up of a crop of carrots may be attended with considerable expense, the above crops produce will amply repay, and leave a very handsome profit.

The uses to which this root are applied are various. Large quantities are sent to the London markets, and also given as food to different kinds of live flock. Horses are remarkably fond of carrots; and it is even said, that when oats and carrots are given together, the horses leave the oats and eat the carrots. The ordinary allowance is about 40 or 50 lb. a day to each horse. Carrots, when mixed with chaff, that is, cut straw, and a little hay, without corn, keep horses in excellent condition for performing all kinds of ordinary labour. The farmers begin to feed their horses with carrots in December, and continue to give them chiefly that kind of provender till the beginning or middle of May, to which period, with proper care, carrots may be preferred. As many farmers are of opinion that carrots are not so good for horses in winter, as in spring, they give only half the above allowance of carrots, at first, and add a little corn for a few weeks after they begin to use carrots.

The result of the inquiries made by the above author in Suffolk, as stated in the survey of that district, is, that they give "at Sutton fix horses two loads a week; no corn, and eat little hay. At Shottisham, fix horses one load a week, with corn; in the spring two loads, without corn; eat little hay. At Ramholte, fix horses 72 bushels a week; no oats, and half the hay saved. At Alderton, fix horses 43 bushels a week; oats given, and the faving of hay not considerable. At Alderton oats given, because not carrots enough. At Hollesley, fix horses two loads a week; no corn, fave more than half the hay." And upon reviewing these circumstances, the same author says, it appears that two loads a week are a very large allowance, probably more than are necessary; that with 72 bushels at one place, which is one and three quarters, and one load at another, all the corn is saved; let us therefore decide, that when fix horses eat 80 bushels of carrots a week, which is 13 bushels a week for one horse, they want no corn whatever, and will eat only half the hay of corn-fed ones. This will enable us to ascertain the value tolerably, though not exactly, because we do not, says he, know what would be the fair allowance of oats to balance such feeding with carrots." The whole turn of the intelligence he received ran, he says, upon the vast superiority of condition in which horses are kept by carrots to that which is the result of corn-feeding; for this evident reason, carrots are given nearly, if not quite, in large quantities as the horses will eat them; but the oats are never given in such a manner, they are always portioned out in an allowance far short of such plenty. A quarter and a half of oats would, he is persuaded, from the general turn of every man's conversation, be inferior to two loads of carrots; this at 20s. is 11. 10s. and there is to be added the faiving of half the hay, which may be called 10 pounds per horse a day, or 70 pounds per week, which, at 50s. a ton is 11. 4s. per horse, and 8s. for fix; which added to 11. 10s. for corn, makes at all 11.
...78s. against 80 buills, or 15s. a load: and that this is a
moderate calculation, appears, he thinks, from the decided
preference given by several farmers in favour of carrots at
15s. a load, against oats at 20s. a quarter, not reckoning the
carrots by any arbitrary estimation, but supposing themselves
to be the one or the other. The prime cost is calculated at 78.
a load; and that this is fair, will, he thinks, appear by the following statement of the articles:

| Rent, tythes, and poor-rates | 1 5 0
| Ploughing                   | 0 7 0
| Harrowing, &c.              | 0 1 0
| Saled and fowing            | 0 6 0
| Hoesing                     | 0 1 8
| Taking up ten loads, at 1s. 2d. per load | 0 1 1 8

2 18 8

The tenth of which is, he says, 5s. 1d. or per bui ller one
penny three-farthings; call it, however, two pence per
buiffer, or 6s. 8d. per load, and if to square with one article
of intelligence it is made 7s. it will not amount to two pence
bearing the bui ller: here, therefore, says he, another view
opens upon us, which is the farmers profit; the carrots are
worth, in feeding his team, 15s. but they cost him only 7s;
he has therefore the advantage of 8s. a load as the grower,
on all his horses consume, and on an average 4l. an acre.

Another way by which a friend of his, he says, made his
calculation, was this: at one load and a half of carrots,
ine loads a moderate acre, last six horses six weeks. He
was inclined to think, from the intelligence, that one load and
a half ought to be esteemed the proper quantity, and five six
quarters of oats, which at 20s. is £ 6 0 0
Three cwt. and a half of hay a week faved, 21
cwt. at 23. 6d. - - - - - - - - - - - - 2 12 6
The carrots may coal - - - - - - - - - - - - 8 12 6
Farmers profit per acre by feeding horses - - - - - - - - - - - - 5 9 6

It admits of various calculations, says the writer; but view
it in any light you please, the result is nearly, though not ex-
actly, the same. Two facts result, he thinks, most clearly
from the intelligence; viz. that horses do upon them as
well as upon oats, and that this application will not only pay
the charges of culture, but leave a profit nearly as great as
the grofs produce of a common crop of wheat. He
wonders, therefore, the farmers cultivate them for their own ufe alone,
without any view to a sale. It should farther be reenounced,
he says, that this result takes place, not in a district where
the horses are poor mean animals that betrand a want of good
food, but, on the contrary, amongst the most ufeful teams
that are to be found in England; and that these teams are
the fattest, and in the highest condition, when they are sup-
ported by carrots. No greater proof of the excellency of the
food can, he thinks, be wished for, than the horses going
through the barley-fowing upon it, and the root doing better
at that season of hard labour than earlier in the winter; this
seems to speak, he says, the heartiness as well as wholefome-
ness of the food. One conclusion very naturally arises from
this part of the intelligence, that the crop, or a considerable
part of it, ought to be taken up in autumn, and packed in
a barn, in which they would much sooner lose their juiciness,
and acquire a more withered flate, in which they are found to
yield the best nourishment for animals.

But the author of the New Farmers' Calendar, who says
he has given carrots to horses of every description, and that
the practice is perfectly familiar to him, observes, "that neit-
ther cart nor plad-horses, although they will perform very
well whilst fed with carrots, are able to go through so much
lubour, or to do it with so much grace or safety to themselves,
as when they are allowed corn; and the only proper appli-
cation of carrots to horses is to such as either do not work
at all, or very moderately; but should the carrots be sub-
tituted for hay instead of corn, it makes a very material dif-
tference in the question, and in many cases such a dispensation
might be advantageous in all points. If a man can maintain
his cart-horses in good working order and good health, as
many really do, upon these roots, instead of oats, he has
nothing farther to say, except in praise of his economy; he
only infers, that the very severe labour which he has been
accustomed to fee horses go through, could not be endured
without corn; and that he has known horses absolutely
ruined by working them upon carrots, when the labour was
by no means hard enough to have injured them had they been
properly fed with corn. He has little to say on this subject,
since he has himself sufficiently often ridden and driven
horses carried on carrots, watching their daily condition, and mark-
ing even the dew upon their coats, the heaving of their
thucks, and the comparative tone of their muscular exertions."

This writer's opinion, however, seems chiefly to rely upon
their being a laxative, and consequently a debilitating food,
which is probably not the case when they are taken up and
kept in a dry place for a proper length of time, so that a por-
tion of the juicy material may be disipated.

In March—this sort of food is in the greatest perfection,
as much of the succulence of the roots is disipated, and from
their being in some degree withered, they bend in the hand.
Every part of them is therefore highly nutritious, being full as
hearty a food as oats. It is, of course, an object of vast im-
portance to the farmer to be well provided with this root for
use in February, March, and the following months.

Carrots have likewise been made ufe of for fattening cattle
with great success; fome, indeed, think that this is the most
advantageous way of applying them; and there cannot be any
doubt but that they must be highly useful in this way; from
the great quantity of faccharine matter they contain. They
have also been long proved to be excellent food for milch
 cows, the spring, as they certainly give no bad taste to the
bilk or butter, while the quantity of both is greatly in-
creased by their ufe. For this last ufe they should probably
be employed without being much kept, as in that way there
will be the largest proportion of the juicy liquor in them,
which is of advantage in this intention.

Sheep have also been frequently fattened on this root in
Suffolk; and from Mr. Young's account, who seems to have
fully considered the carrot-husbandry, a good crop will weigh
11 tons, which quantity, he supposes, will feed 20 wethers
for 100 days, in which space they will be completely fat-
tened. In Norfolk it is reckoned a good crop of turnips
that will fatten eight wethers; so that it would seem that one
acre of carrots will go as far in fattening these as two acres
and a half of turnips, which is a circumstance that deferves
the farmer's attention in many situations. The same writer
also further states, that the expense of cultivating carrots ex-
cedes that of turnips by 1l. the acre. To counterbalance
which, he says, the carrots are much more impenetrable to
fruit, if left in the ground to be taken up as wanted; they
are not subject to any deleterious similar to that of the
fly in turnips; and that they are found at a feaflon when they
cannot suffer by drought; while, of late years, turnips have
suffered so much in various ways, as to have subjected the
farmers,
Carrot.

Farmers, particularly those of Norfolk and Suffolk, to very heavy losses. Besides, carrots can be prefered with certainty to an advanced period of the spring, as April or May, when the fattening of cattle is more expensive than at any other season, the superiority of carrots over turnips must, he thinks, appear evident to every practical farmer. He further adds, that with all these advantages, it might naturally be expected that carrots should be more universally cultivated, and that the only reason why they are not, is because their value is not ascertained, or made generally known. Some such reason as this would appear also to be the cause why the cultivation of so valuable a crop should be confined to one particular district of the kingdom; which, without doubt, if it were commonly cultivated, would be the means of saving an immense consumption of oats, beans, and peas, which are at present given to horses and other animals. This sort of crop is likewise of great utility in the keeping of store pigs; but they will not probably fatten them without the assistance of cress or milk. In the experiments of the Reverend Mr. Young, this seems to have been exactly the case, as the hogs, in many instances, gained weight, though they did not become fat under this management. See Swine.

The able writer of the Suffolk report has further remarked, that the next circumstance to be attended to is the advantage of the plant as a preparation for corn; all the minutes agree, says he, that the barley after them is good and clean; several persons were inclined to think it equal to that after turnips fed on the ground; but the fair result is evidently, that if carrots were so fed, the barley would be much superior, of this the intelligence he received will not, he says, permit us to doubt. It is, however, fair to observe, that they one and all declare for putting them in good land, and in this course: 1. turnips; 2. barley; 3. carrots; 4. barley, &c.; from which it appears, that on these sandy soils, they are not to be depended on for cleaning them when foul with coals.

The utility and advantage of the carrot root have been already shown in many instances: it is, however, obvious, that the value of crops of this description must vary in a considerable degree, according to the manner in which they are employed in their consumption. The differences have been found to be from two to three pence halfpenny to two shillings the bushel; in general it may, however, be from about sixpence to eight pence, and perhaps in some instances tenpence or a shilling. In the trials of different experimenters, as stated in the 25th volume of the Annals of Agriculture, under different modes of application, the results were these:

<table>
<thead>
<tr>
<th>Application of crop</th>
<th>Value per Bushel</th>
</tr>
</thead>
<tbody>
<tr>
<td>In feeding all sorts of cattle</td>
<td>0 0 2½</td>
</tr>
<tr>
<td>Average in different ways</td>
<td>0 1 0</td>
</tr>
<tr>
<td>In fattening oxen</td>
<td>0 0 6</td>
</tr>
<tr>
<td>In fattening hogs, boiled</td>
<td>0 2 0</td>
</tr>
<tr>
<td>When used instead of oats for horses</td>
<td>0 0 6</td>
</tr>
<tr>
<td>In fattening hogs, raw</td>
<td>0 0 8</td>
</tr>
<tr>
<td>In fattening sheep</td>
<td>0 0 4</td>
</tr>
</tbody>
</table>

It has been remarked by a late practical writer, that from the great facility of cultivating this sort of crops, the little risk that attends them, their very general application in the feeding and fattening of different sorts of domestic animals, the large proportion of manure that they afford, and their great utility in the preparation of the land for grain crops; they may in most cases be considered not only preferable to turnips, but much more advantageous and better suited to all soils of the pure sandy or light sandy loam kinds.

It has been suggested by Mr. Baker, that the large tops of this root might be rendered more extremely beneficial by having them converted into a sort of coarse hay, by moving them over while in their young, green, juicy state of growth, without injuring the heads or stems of the plants, some what in the manner noticed above; and then letting them become perfectly dry on the ground; as in this way, he affirms, that two tons of fodder may be produced from an acre of land. It is plain, however, that in this practice injury must be done to the growth of the roots, besides its being uneconomical, on account of the great loss that would take place in the drying of such succulent materials, which can be wholly consumed without it. It is unquestionably a much less safe and method of management to have them consumed in the yards by some sort of flock, as they are taken up; because in this way not a particle is lost, from the great avidity with which almost all sorts of animals devour them.

When it is thought necessary to have the roots cleaned before they are given to animals, it may be readily performed in the same manner as for potatoes.

The author of the Agricultural Survey of the County of Suffolk concludes this interesting subject with "carefully calling on all persons who have land, or light sandy loams, to determine to emancipate themselves from the chains in which prejudice or indolence has bound them; to cultivate this admirable root largely and vigorously; to give it the benefit they have; to plough very deep; to hoe with great spirit; and to manure corn from their stables, as a mere luxury and barren expense, that ought to be extirpated: an effect that flows very fairly from the preference which the instinct of the four-footed inhabitants generally gives to carrots." They should not, he thinks, be confined to small clumps of an acre or two, but be introduced regularly in the courses of the crops of the farm in the same manner as wheat, barley, turnips, or any other plant. None, in his opinion, pay better, and very few so well; and besides they are capable of a very general application, no root being fit for serving more useful purposes.

The penalty for fleasting carrots is the same with that for fleasting turnips, potatoes, cabbages, parsnips, and peas; for which see Turnips.

Carrot, wild, in Agriculture, a weed of the biennial kind frequently met with in pastures lands, where the soil is inclined to be dry. Wherever it is found it should be extirpated as soon as possible before it flowers and sheds its seeds, if this is not attended to, it will increase with rapidity, and become more troublesome as well as difficult to remove. It has sometimes the name of birds' nest, from the head, after flowering, contracting somewhat into that form. See Dauclus.

Carrot, Candy, in Botany. See Athamanta cretensis.

Carrot, Deadly, or Scorzing, See Thapsia.

Carrot, Mountain, a species of fennel. See Fennel.

Carrouge, Bertrand-Augustin, in Biography, an ingenious astronomer of France, was born at Dij, on the 8th of October, 1741, and on account of his merit and ingenuity, he was appointed "Administrateur General des Poules," by Reveilleire-Lepaux, the director. Notwithstanding his advancement to this office, which rendered him, in some degree, independent, he applied with diligence to astronomy. He calculated 1000 stars for the celestial globe published by C. Lamarche, successor to Fortin, and made many calculations for the "Connoissances des Temps," and the second edition of Lalande's astronomy. He also published several memoirs in the "Connoissances des Temps," and, a few days before his death, which happened on the 20th of March, 1798, he delivered to Lalande tables for calculating the
CARROUSAL, or CARROWSAL, properly a course, or
countell of chariots and horses: or a magnificent entertain-
ment, on occasion of some public rejoicing: consisting in a
cavalcade of several persons, richly dressed, and equipped
after the manner of the ancient cavaliers, divided into squa-
drons, meeting in some public place, and practising jousts,
tournaments, and other noble exercises. The term is since
become of more general use, and is given to any merry
meetings. The word comes from the Italian carosello, a
diminutive of carro, chariot. Tertullian alibrizes the invention
of chariots to Circe; and will have it inflicted in honour of
the Sun, her father: whence some derive the word from
carrus, or carrus folis. The Moors introduced cyphers,
divisional, and other ornamens of their arms, with trappings,
&c. for their horses. The Goths added crests, plumes, &c.

CARR-TAKERS, are officers of the king's household,
who, when the court travels, have charge to provide wag-
gons, carts, &c. to transport the king's furniture and bag-
gage.

CARRUCA, in Antiquity, a splendid kind of carr, or
chariot, first mentioned by Pliny, mounted either on one
wheel, like our wheel-barrows, or, as is more probable, on
four wheels, richly decorated with gold, silver, ivory, &c. in
which the emperors, senators, and people of condition, were
carried. The carruca, or coaches of the Romans, were
often of solid silver, curiously carved and engraved; and
the trappings of the mules, or horses, were embossed
with gold. This magnificence continued from the reign of
Nero to that of Honorius; and the Appian way was covered
with the splendid equipages of the nobles, who came out to meet St. Melanius, when she returned to
Rome, six years before the Gothic siege. Seneca Epif. 87.
Pliny H. N. xxxiii. 49. The Romans considered it as an
honour to ride in those that were remarkably high. In
the Theodosian code the use of them is not only allowed to
civil and military officers, but enjoined as a mark of their
dignity.

The word comes from the Latin carrus, or British care,
which is still the Irish name for any wheel-carriage.

CARRUCA was also sometimes used for carruca. See
Carrucate.

CARRUCATE, in Rural Economy, a term employed by
some old writers to signify a plough. It is sometimes
written Carruc.

CARRUCATE, in History, a term which denotes the
ploughing of ground, either ordinary, as for grain, hemp,
flax; or extraordinary, as for wood, dyer's weed, rape-feed,
&c.

Carrucate, carucatum, a kind of tax anciently im-
ploved on every plough, for the public service. See
Carrucate and Hidage.

CARRUCATE, or Carucata, in our Ancient Law
and History, denotes a plough land, or as much arable as
could be tilled and managed by one plough and the bealls
belonging thereto in a year: having meadow, pature, and
horses for the householers and cattle belonging to it.

In the Domesday Survey, the hide and carucate appear
to be the same; the hide being the meafure in the Con-
feffor's reign; and the carucate that to which it was re-
duced by the Conqueror's new standard. Thus, different
places are said to have paid gold for so many hides, T. R. E.
in the time of the Confeffor. And then follows the exifing
meafure of so many carucates. "Et alia, Carucatum." Mr.
H. P. Wyndham, however, in his "Wiltshire, extracted from
Domesday Book," 1788, distinguishes between "hides" and
"carucates," though they have hitherto been considered as
synonymous terms. Accordingly, he conjectures, that the
first was intended to signify "the valuation of the efteft,"
and the latter "the meafure of the land."

In some of the counties, as those of Nottingham, Derby,
and Lincoln, only carucates are mentioned. But in others,
as we have already mentioned, both occur.

The contents, however, of the carucate are very variously
flated; and, in fact, we have no enteron in any one county
for judging of its real extent. The Liber Niger, as well as
several of our ancient chartularies, eilem it to contain a
hundred acres; while it is carried by other authorities to
an hundred and twenty: and the Liber Elenensis afferts, that
some carucates even of two hundred and forty acres. In
the early part of the reign of Richard I. it is flated to have
been estimated at fifty acres; and so have continued till his
ninth year, when in the fve milage, it, was fixed the hundred
of Edward I. It appears to have been more than once estimated
at one hundred and eighty acres: and in the 23d of Edw. III. a carucate
of land in Burcefter contained a hundred and twelve acres, and
in Middleton a hundred and fifty. Nor was the calculation
of its extent under other circumstances less liable to varia-
tion. The Monasticus Anglicanus (tom. i. p. 75.) says,
that fourteen carucates made a knight's fee. A manuscript
register of Fountains's abbey, fifteen. Another mentions
twelve. And one of Dodworth's manuscripts in the Bod-
leian goes to forty-eight. A charter of the 5th of Edward III.
records, that each of three carucates of land which the abbot of
Norton held in the New Forest consisted of a hun-
dred acres: and a familiar measure is reported in a patent
of Henry IV.

The measurement of the carucate then appears to have
been arbitrary, and differs considerably not only in different
counties, but even in different districts of the same county.
It appears, likewise, to have been various at various times.
And for different purposes a larger or a less number of acres
appears to have been required. It seems clear, says the
historian of plough-land, that the commissioners, in the surv-
ey of that county, at leat, from the convition that hides
and carucates were of no certain meafure, and that they
differed still more in quality than they did in meafure,
adopted the very rational mode of determining the value of
the land by the number of ploughs that were actually em-
ployed, or in their judgment might be employed on it. "We
sometimes find that the number of ploughs is consid-
ernably less than the number of plough-lands; and some-
times the commissioners tell us the land would have admi-
itted of more ploughs than were then in actual use. And it is but
reasonable to conclude, that certain lands had been in a
better late in the time of king Edward, than they were
in the reign of William I. from their having more ploughs
at work on them; and, on the contrary, that other lands
were much improved at the time of the survey, as they had
more ploughs at work than they had been employed in the
days of the Confeffor. There are few parishes in some of the
counties that can be made intelligible in any other way of
Hutcheson's Diff. of Dom. Pref. to the Riff. of Leic. Antiq. Difc. i. 46, 47. Huchins's Diff.
Hon. 622. By a statute under William III. for charging
perera to the repair of the highways, a plough-land is rated.
CARRUCCI, Jacopo, called Pontormo, from the place of his nativity, in Biography, was born in 1490, polished great natural genius, and in his earliest works was admired by Raphael and Michael Angelo. His instruction, derived in regular succession from Leonardo da Vinci, Alberti, and Pier di Cima, was completed in the school of Andrea del Sarto, who, by jealousy and ingenuous treatment, converted the scholar into a rival. Notwithstanding his talents, he frequently changed his style and became the victim of inconsistency. The "Certosa" of Florence exhibits specimens of the three different manners commonly ascribed to him. The first, being correct in design and vigorous in colour, approaches the style of Andrea del Sarto; the second, combining with good drawing a languid tone, became the model of Bronzino and the subsequent epoch. The third is a direct imitation of Albert Durer. To these might be added a fourth manner, if the freeces of the general deluge and universal judgment, on which he spent eleven years, and his last work, had not been white-washed, with the tact acquireance of all contemporary artists. In this labour he strove to imitate Michael Angelo, and to exemplify, like him, anatomic skill, which was then becoming the favourite pursuit of Florentine art. This artist died in 1558, aged 65. Pilkington, by F u f e l l.

CARRYING, in Falconry, signifies a hawk's flying away with the quarry.

Carrying is one of the ill qualities of a hawk, which the acquires either by a dislike of the falconer, or not being sufficiently broke to the hunt.

Carrying, among Huntmen. When a hare runs on rotten ground (or even sometimes in a brook), and it flies to her feet, they say the carriers.

Carrying, among Riding-Masters. A horse is said to carry low, when, having naturally an ill-shaped neck, he lowers his head too much. All horses that arm themselves carry low; but a horse may carry low without arming. A French branch, or gigot, is prescribed as a remedy against carrying low.

A horse is said to carry well, when his neck is raised, or arched, and he holds his head high and firm, without constraint.

Carrying wind, a term used by our dealers in horsey to express such a one as frequently tolls his nose as high as his ears, and does not carry handomely. This is called carrying wind; and the difference between carrying in the wind, and beating upon the hand, is this: that the horse who beats upon the hand, shakes the bridle and refits it while he shakes his head; but the horse that carries in the wind puts up his head without shaking, and sometimes beats upon the hand. The opposite to carrying in the wind, is arming and carrying low; and even between these two there is a difference in wind.

CARS, Laurence, in Biography, a French engraver of great merit, flourished about the year 1762, and resided at Paris. His prints were numerous; and the following are from Le Moine, viz. a portrait of "Louis XIV. surrounded with emblematical figures;" "Hercules and Omphale;" "Perseus and Andromeda;" "Time and Truth," and "Nymphs Bathing." Strutt.

Cars, in Geography, supposed by some to be the Chorfa of Ptolemy feated on the banks of the Euphrates, a city of Armenia, the last town of Turkey towards the frontiers of Persia. It is built on a rising ground, exposed to the south-west, and behind it a deep valley, watered by a river, which, not far from thence, discharges itself into the Arpad, without ever coming near the city of Erexon, contrary to the description given of it by Ptolemy. These two rivers joined together are known by the name of Arpad, and serve as a frontier to the two empires. N. lat. 41° 30'. E. long. 43° 30'.

Carso, or Ca/e of Gowry, a district of Perthshire, in Scotland, lying on the N. side of the Tay, extending 14 miles in length from Dundee to Perth, and being from two to four in breadth. It is a rich plain country, cultivated like a garden, and producing as good harvests of wheat as any in Great Britain. Its situation, however, is damp and low, so that the inhabitants are subject to agues, and the common people are in great want of fuel for firing.

Carsofli, in Ancient Geography, a town of Italy, belonging to the Sabines at the 22d mile on the Valerian way. Livy calls it in one place a town of the Marsi, and in another a town of the Perusii; and it might probably have been occupied by one and the other of those people alternately. Livy says that it was a Roman colony, established in the year of Rome 454; and in the map of M. D'Anville it is marked in the country of the Sabines. The precise situation of this place was not known till it was discovered, in 1615, by Holtenius, near the mountains called "Rio Fieddo," and it has been again ascertained, in 1766, by the abbé Chauppy. From an ancient inscription found in this place it appears, that this city was a colony, and that it had a college of priests called "Dendrophurn," consecrated probably to some rural deity.

Carsofli, a town of Dacia, according to Ptolemy, supposed to be the present Kurmm.

Carsofli, in Geography, a small ill-built town of Naples, seated on the side of a steep hill, which slants up a defile of the mountains. It is just within the limits of the Neapolitan state, for on the plain below is the point of division at an inn called "Il Cavaliere," where some custom-house officers are stationed. This town bears the name of the ancient city of Carsofli, though its ruins lie near a mile off in the plain. Carsofli is a portion of the immense demesne possessed by the countable Colonna, who has 37 manors in this neighbourhood.

Carpares, William, in Biography, an eminent Scots clergyman, was the descendant of an ancient family, and born in 1640 at Catcgrar, near Glasgow. Having received the rudiments of his education in the academy of a Presbyterian clergyman, where he formed many important connections, and where he acquired a fluency of expression in the Latin language, as no other was allowed to be spoken in his family; he pursued his theological and philosophical studies in the university of Edinburgh, and afterwards at Utrecht, whether his father sent him for the purpose of avoiding those political contests which agitated the reign of Charles II., and to which his active and enterprising spirit seemed to incline him. Here, however, he was involved in those political intrigues which were occasioned by the alarm excited in England about the Popish succession. By means of a letter of recommendation, obtained from a physician in London, who carried on a correspondence with persons belonging to the court of the prince of Orange, he was introduced to the penitent Fagel, and afterwards to the prince himself; and by him he was entrusted, on account of his sagacity and information with regard to the state of political parties at home, and his ardent attachment to the interests of civil and religious liberty, with his deigns relating to British affairs. During his residence in Holland, his principles, both in religion and politics, were strongly confirmed; and upon his return to his native country, he entered...
tered with zeal into the councils and schemes of those noblemen and gentlemen who opposed the tyrannical measures of government. His political engagements, however, did not divert him from pursuing the profession of divinity; and when he had passed through his previous examinations, he obtained a licence to preach. But as he had no prospect of usefulness in his clerical character, and as his mind seemed to have acquired a decided bias towards politics, he determined to revisit Holland. On his way thither he passed through London, and was employed by Argyle, and the other Scotch patriots, in treating with the English exiles. Towards the close of the year 1662, he held various conferences with the heads of that party, which terminated in his being appointed to that body called the "Rye house plot." Accordingly, he was committed to close custody in the Gate-house, Westminster. After several examinations before the privy council, he was sent for trial to Scotland; and as he refused to give any information respecting the authors of the exclusion scheme, he was put to the torture, in order to extort from him a confession. This cruel treatment he endured with invincible firmness; but when milder methods of a more inquisitorial nature were adopted, and a pardon was proposed, with an assurance that no advantage should be taken of his answers as evidence against any person, his resolution failed, and he consented to answer their interrogatories. The privy council immediately caused to be printed a paper, entitled, "Mr. Caria- rares's Confession," which contained, as he said, a false and mutilated account of the whole transaction; and in direct violation of their promise, they produced his evidence, as they termed it, to be produced in open court against one of his most intimate friends. This treachery and its consequences very deeply affected him; but as soon as he was cleared, he obtained permission to retire to Holland, and towards the close of the year 1684, or the beginning of 1685, when he was kindly received by the prince of Orange, who appointed him one of his chaplains, and caused him to be elected minister of the English Protestant congregation at Leyden. In this situation he was singularly useful to the prince and his party in concerting those measures that terminated in the revolution. When the prince determined to transport an army to England, Caritares accompanied him as his chaplain, and continued about his person till the settlement of the crown. During the whole of this reign he was the chief agent between the church of Scotland and the court, and he contributed by his influence with the king to the establishment of presbytery in Scotland, to which his majesty was disinclined, and to that coalescence or accommodation on the part of the Presbyterian clergy with the Episcopalians, which the bigotry of the former made it difficult for him to effect. When an act was passed, in 1693, by the Scots parliament, obliging all officers, civil and ecclesiastical, to take an oath of allegiance, and also to sign an assent, (as it was called,) declaring William to be king by the false, the general refused to sign the declaration, and appealed to the privy council, who recommended to the king to enforce the obligation. Accordingly, measures were adopted for this purpose; and the body of the clergy applied to Caritares, requesting his interference in their favour. The king perfunctory in his resolution; orders were renewed in peremptory terms, and dispatches were actually delivered to the messenger to be forwarded next morning. In these critical circumstances Caritares interposed; he hastened to the messenger at night, demanded the dispatches, which had been delivered to him in the king's name, and instantly repaired to Kennington, where he found his majesty gone to bed. Having obtained admittance into his chamber, he gently waked him, fell on his knees, and asked pardon for the intimation, and the daring act of disobedience of which he had been guilty. The king at first expressed his displeasure; but when Caritares further stated the case, his majesty caused the dispatches to be thrown into the fire, and directed him to send such instructions to the royal commissioners of the general assembly as he thought most conducive to the public good. In consequence of this reasonable interposition, the oath and assurance were dispensed with on the part of the clergy. By this timely service Caritares acquired the confidence of the Presbyterian party to such a degree, and he so successfully cultivated the friendship of the Earl of Portland, and other men of influence, that he was soon regarded in the management of Scotch affairs, as a kind of viceroy for Scotland, though he possessed no public character. Although he acted with consummate prudence and delicacy, he could not escape envy: but he retained the esteem of those whom he most valued; and the king once said of him, "I had long known Mr. Caritares; that he knew him well, and knew him to be a honest man."

Although, after the death of King William, Caritares was not much employed in public affairs, Queen Anne continued him in the office of royal chaplain for Scotland, and obtained for him the offer of an appointment to the vacant place of principal of the university of Edinburgh; which he accepted in 1704, with the hope of profitorium of divinity. After this appointment, whilst he refused any addition to his own salary, he used his influence at court for augmenting the very small salaries pertaining to the regents in the several universities of Scotland; and in the execution of his office, as principal, he secured the affection and respect of those who were subject to his authority, by the dignified deportment and gentlems of his demeanour. In the year of his appointment to the principalship of the university, he was unanimously invited to the pastoral office in one of the parishes of Edinburgh, which he performed with exemplary diligence; and as moderator of the general assembly, which held its four times in eleven years, he maintained great weight in its debates. When the union of the two kingdoms was agitated, it engaged his cordial concurrence, and he was the principal instrument of preventing any public opposition from the Presbyterian clergy. His efforts to control the bigotry of this body rendered him unpopular; and with a view of gaining their good opinion, he accepted the office of one of the agents, sent to London to oppose the bills for the reformation of patronage in Scotland, and for the toleration of the episcopal clergy; though in the latter instance, at least, his opposition must have counteracted his principles. His example seems to have been an apprehension that the Scots episcopalian wished the exiled family to be restored. His efforts, however, whether they were sincere or not, proved unsuccessful. To the incendiarism of the house of Hanover he gave his active support; and he obtained from the general assembly an address of congratulation to George I. on his accession to the throne; and in return for this service his office of royal chaplain was continued. His death happened soon after this event, in December, 1714. "His private character was highly respectable. His religion was free from enthusiasm and superstition, and his charity and bounty comprehended all sects and parties. His memory is revered by his countrymen as that of a true and enlightened patriot, and few have held an active course amidst violent public contentions with less reproach." See State papers and letters, addressed to William Caritares, confidential secretary to King William, during the whole of his reign, afterwards principal...
of the university of Edinburgh, relating to public affairs in Great Britain, but more particularly in Scotland, during the reign of king William and queen Anne; to which is prefixed the life of Mr. Carstairs; published from the originals, by Joseph M'Cormick, D.D. minister at Preston-pans. 1744.

Brock. Brit.

CARSULNE, in Ancient Geography, a town of Italy, in Umbria, situate between Narnia and Mavania, on the Flaminian way. According to Strabo it was a place of considerable note, and from Tacitus we learn, that it was about 10 miles distant from Narnia. Livy alligns it to a people called Carfalli.

CARSUM, a town of Lower Moenia, according to Ptolemy. It is placed in the Itinerary of Antonine between Capidava and Cion.

CARSUMBLIA, in Geography, a town of European Turkey, in the province of Servia; 12 miles W. of Pirecop.

CARSUS, in Ancient Geography, a river of Aetia, in Cilicia; which springing in mount Amans, near the town of Ernea, ran to the fourth-well between the branches of this mountain, watered the town of Epiphania, and discharged itself into the Mediterranean, at the bottom of the gulf "Illicum.

CART, a vehicle mounted on two wheels, drawn by horses, used for the carriage of heavy goods. The word seems formed from the French charette, which signifies the same; or rather the Latin carota, a diminutive of carus. See Carr.

Mr. Sharp's rolling cart is fixed upon two rollers, running abreast, or parallel with each other, and both placed under the body of the cart, working upon pivots like the wheel of a wheel-barrow. The rollers are both cylinders of cast iron, two feet diameter, and sixteen inches broad. An iron spindle passes through the centre of each roller, upon the ends of which rest the four planks that support the body of the cart. Criminals are drawn to execution on a cart. Bawds and other malefactors, are whipped at the cart's tail.

Scripture makes mention of a fort of carts or drags, used by the Jews to do the office of threshing. They were supported on low thick wands, bound with iron, which were rolled up and down on the sheaves to break them, and force out the corn. Norden and Niebuhr, in their "Travels," inform us, that this method of threshing is still practised in Egypt and Arabia. The former says that in Egypt they thrice, or rather, tread, rice by means of a sledge drawn by two oxen, and that the man who drives them is upon his knees, whilst another has the care of drawing back the sledge, and of emptying it from the grain that remains underneath. In order to tread the rice they lay it on the ground in a ring, so as to leave a void circle in the middle. The Arabians, says the latter writer, in threshing their corn, lay the sheaves down in a certain order, and then lead over them two oxen, dragging a large sledge. They use oxen in Egypt, he adds, as the ancients did, to beat out their corn by trampling upon the sheaves, and dragging after them a clumsy machine. This machine is not, as in Arabia, a long cylinder; nor a plank with sharp edges, as in Syria; but a fort of sledge, consisting of three rollers, fitted with irons which turn upon axles. A farmer chooses out a level spot in his fields, and has his corn carried thither in sheaves upon asses or draymules: two oxen are then yoked in a sledge; a driver gets upon it, and drives them backwards and forwards, or rather in a circle upon the sheaves, and thence oxen succede in the yoke from time to time. By this operation, the chaff is very much cut down; the whole is then winnowed, and the pure grain thus separated. Something of the like kind also obtained among the Romans, under the denomination of plagula, of which Virgil makes mention. Georg. I.

Turdagog El有些 matr-veniunt plagulae, Turdagon, turcas—

On which Servius observes, that trotho donates a cart without wheels, and turbula a cart armed on all sides with teeth, used chiefly in Africa, for the thing corn. The Septuagint and St. Jerome represent these carts as furnished with faws, informing that their surface was bevel with teeth. David having taken Rabbah, the capital of the Ammonites, ordered all the inhabitants to be crushed to pieces under such carts, moving on wheels set with iron teeth; and the king of Damascus is said to have treated inhabitants in the land of Gilead in the same manner. 2 Sam. xii. 31. Amos. i. 3. Calm. Dict. Bibl. tom. i. p. 356.

CART, in Agriculture, is a carriage or vehicle constructed with two or more wheels, and drawn by one or more horses. It is employed for the purpose of conveying manure, hay, grain, and various other articles which are connected with the farm. Carts are made of different forms and dimensions, in some districts according to the nature of the materials they are intended to carry, and the uses to which they are applied; but by suitable contrivances they may be easily constructed, to carry for the farm-cart to serve different uses. In the more southern parts of the kingdom this is mostly the case, where there is not only a considerable saving, in fewer carts being wanted, but likewise in less room being taken up by them in the fields or houses where they are kept. In these situations they are mostly formed into a close manner, having ladders or other similar contrivances applied when they are wanted to convey any of the more bulky sorts of materials, such as hay, straw, &c.

It is obvious that the chief object in the construction of carts should be to adapt the wheels and axle in such a manner, that the power may be applied in the most favourable direction for draught, and that the carriage may move with the least possible force. In this view the height of the wheels should likewise be well adapted to that of the animals which are employed in drawing them; but the exact heights which are the most favourable under different circumstances have not yet been fully shown by any trials that can be fully depended upon. There is likewise another point which ought to be particularly considered in the making of farm-carts, which is, that they are not more heavy than is necessary; which is too often the case in the southern parts of the island. It has been remarked that the large heavy carts and waggons, which are so common in the southern districts, are not only reprobatate, but almost wholly in disuse in those of the north, where small carts are in general use. Though there cannot be any doubt but that carts must vary in their forms, sizes, and modes of construction, according to the nature and situation of the roads, and many other local circumstances; yet for the purposes of farming, especially in field work, probably those of the light, single, and two horse kind may in general be the most advantageous, convenient, and useful.

It has been observed, in the twenty-seventh volume of the Annals of Agriculture, by lord Robert Seymour, that "the advantages of single-horse carts are, he believes, universally admitted, wherever they have been attentively compared with carriages of any other description. By his own observation he is led to think that a horse, when he acts singly, will do half as much more work as when he acts in conjunction with another; that is to say, that two horses will, separately,
separately, do as much work as three conjointly; this
artists, he believes, in the first place, from the single horse
being so near the load be drawn; and, in the next place,
from the power or line of draught being so much below his
breast, it being usual to make the wheels of single horse
wagons very low. A horse harnessed single has nothing but
his load to contend with, whereas when he draws in con-
junction with another, he is generally embarrassed by some
difference of rate, the horse behind or before him being
quicker or slower himself; he is likewise frequently in-
convenienced by the greater or lesser height of his neighbour;
these considerations give, he conceives, a decided advantage
to the cart he is recommending." If any other is
wanted, that "of the very great wheeled cart...is filled
most of all he besieges, added: as a man may load it, with
the help of a long-handled shovel or fork, by means of his
hands only; whereas, in order to fill a heavier cart, not only
the man's back, but his arms and whole person must be
exerted." To the use of single horses in draught he has
heard no objection, unless it be the supposed necessity of
additional drivers created by it: the fact however is, that
it has no such effect; for, horses once in the habit of going
fingly, will follow each other on, and as steadily as they
are drawn harnessed together; and accordingly we see,
from the most frequented roads in Ireland, men
conducting three, four, or five, single horse carts each,
without any inconvenience to the passenger; such likewise,
is the case in this country, in which lime and coal are
generally carried upon pack-horses, where one man manages
two or three, and sometimes more." And in a preceding
volume of this work, Mr. Young is decidedly of the
same opinion, which he clearly shews to be founded in truth,
by entering into a variety of discussion in respect to the
points in which they are preferable to tumbrils or wagons.
In the northern districts they usually draw in these carts
from twelve to twenty-four hundred weight, and where
the roads are good, occasionally thirty, with much ease and
facility.

And Mr. Donaldson, in his view of the "Preferment State
of Husbandry in Great Britain," seems to think that, "for
carrying on the ordinary operations of husbandry, carts
drawn by two horses are greatly superior to large, cumber-
some, unwieldy waggons, that require four, five, or six
horses to move them along. It has of late," says he, "been a
subject pretty much agitated, whether single-horse carts are
not to a great degree superior to those drawn by two
horses, as these have been represented to be wagons.
Single-horse carts are certainly loaded and unloaded with
much less trouble, and are in every way more easily managed,
especially when carrying out dung, or when used for doing
any odd jobs on a farm." It has also been found, from long
experience and the most attentive observation, that "one
horse will draw, on any road, two-thirds of the load that
two horses, drawing in a line, and of equal power, are
capable of doing. The carters of the town of Falkirk,
in Stirlingshire, for example, have long been famous for the
great weights drawn by their carts. Before the navigable
canal between the Forth and Clyde was made, the whole
goods transported to and from Glasgow, and the ports upon
the Forth, were," says he, "drawn upon one and two-horse
carts belonging to those carters; the most expert of whom
have long given the preference to carts drawn by one horse,
as they experience no difficulty in carrying upon a cart,
drawn by a single horse, from Borrowstounness to Glasgow,
a distance of upwards of thirty miles, and of indifferent road,
from twenty to thirty-five hundred weight." It is, he ob-
erves, further worthy of remark, that "at the great iron-
work at Carron, the company engaged in it formerly made
wagons and waggons, to which cart was and other heavy articles upon; but have entirely laid aside the use of them, and on the principles of economy, employed car-
ters with single-horse carts to transport the heavy articles
which they require."

In the agricultural report of Northumberland it is like-
wise remarked, that "single-horse carts are becoming more
prevalent in several parts of that county; and that Mr.
James Johnson, a common carrier at Hexham, has a horse,
six feet high, that commonly carries from Hexham to
Newcastle 24 cwt., and 20 cwt. back again; and there are
instances of his having carried 26 cwt. from Newcastle to
Hexham, which is a very hilly, heavy-pulling road." It is
also further noticed that "the neatest, most useful, and left
conceived carts we know, are those made in many parts of the
North-Riding of Yorkshire. The single-horse carts of this
construction, used for carrying coals from the county of
Durham into Yorkshire, are 60 inches long, 36 inches
wide, and 18 deep, hold 24 bushels of coals, when let round
the fides with large ones and upheaped. A man, or boy,
drives three of these, two of which are equal to the greatest
quantity ever carried by three horses." Mr. Chappell of
Newton, finds three of these carts for coals every day, which
bring 72 bushels, the distance of 26 miles, there and back,
which is performed in 10 hours by one man. The same
gentleman's two-horse carts bring 36 bushels of the same
coals.

And in the agricultural survey of Cumberland, the writers
say, "the advantages of single-horse carts are so well
understood in this county, that we did not see any other used.
Three single-horse carts are driven without any difficulty,
by a man, or boy, or even women and girls."

The author of the Agricultural Report of Mid Lothian,
states, that "the wheel-carriges employed in husbandry
are only the cloce-cart and the corn-cart, both of a light
construction, drawn by two horses, and of late by one.
The large wains, or heavy four-horse wagons, employed
in English husbandry, are discarced there. Two horses in
carts are commonly loaded with 18 or 20 cwt. One horse
draws still more easily 12 cwt.; even 24 cwt. is frequently put
on a single horse; and 30 cwt. on good roads is not uncom-
mon. And that the first cart of hay has lately been much
improved: when placed on its axle, the bottom at each side
projects over the inner head of the naves as far as nearly
touch the spokes of the wheels; from which acquired
broadness the capacity is enlarged; while the side-standards,
being brought nearer to a perpendicular, are able to sustain
more weight." The dimensions are, the length five feet
three inches; the breadth below, four feet; the breadth
above, four feet three inches; the depth, one foot three
inches; containing about a cubic yard. The price of a
cart, painted, 11. 15s. not including wheels, axle, or mount-
ing, which may amount in all to seven or eight pounds
more. The wheels are generally 52 inches high, the axle
commonly of iron, from an idea, that, in the end, it is more
economical to have them so: for it is not found in practice
that iron axles are either more or less difficult to draw, al-
though not half the thickness of those of wood."

It has been suggested on the ground of much experience,
that, in constructing carts of this sort, the capacity of wags-
gons is by no means an accurate rule to proceed by; as on
finding that they contained in the bed, or back, ninety-six
cubical feet, being twelve feet long, four feet wide, and two
feet in depth; it was supposed that to give one horse the
fourth part of the load of four, it would only be necessary
to let the cart have the space of twenty-four cubical feet, or
to make it four feet by three, with the depth of two; but from the vall superiority of horses working finely, over those in teams, it was soon discovered, that they required to be very considerably enlarged, admitting of having the dimensions of five feet one inch in length of bed or back, three feet seven inches in breadth, with two feet in depth; so as to contain thirty-five cubical feet and a fraction. This, therefore, affords a further striking proof of the great superiority these small carts have over those of the large kind, in the quantity of work which they are capable of performing.

In speaking of the advantage of having low call-iron wheels, it is remarked by lord Seymour, in the paper just mentioned, that "the price of iron, cast into wheels, is 1s. per cwt., and the weight of each wheel about three quarters of a cwt. Two inconveniences only, he believes, have been found from the use of low call-iron wheels: the first is, that call-iron is very liable to breakage, upon concussion; the next is, that the course of so small a diameter creates a very quick consumption of grease. The first of these objections is in a degree removed by the case with which the rim of the wheel is repaired by the application of worked iron, which being joined to it by a rivet, the wheel acquires some little elasticity, and thereby becomes perhaps stronger than when it was new. In order that the supply of grease may keep pace with the consumption, he has introduced four grooves, or cavities, in the boxes, increasing a little towards their centres; and in order to defend the axle-tree, which confits of worked iron, against the harder body of the box, he has fixed the extremity of it."

These small carts are considered by many, from actual experience, to be better adapted to the carrying of all kinds of materials except those of the very bulky kinds, and such as trees, blocks of stones, &c. the weights of which might injure them, and which cannot from their nature admit of division. In all hilly districts, where the roads are of an inferior kind, and the inhabitants poor, these are the carts that are in most general use, and which are found the most advantageous. The superior goodness of the roads in some of the northern parts of the kingdom have likewise been ascribed to the use of these kinds of carts, as large carriages of all sorts that require the wheels to be locked in descending hills, are the destruction of roads.

By the author of the New Farmer's Calendar it is stated that "of the great saving to be made by one-horse carts there can be no doubt, since it has been experimentally proved, and was moreover, easily to be discovered from just theory. More weight may be drawn by fix horses in so many carts, than by eight in a large wagon; and one man may manage two carts in the country." There are, however, he thinks, "some peculiar inconveniences attendant upon this plan, which are sufficiently obvious; and, says he, notwithstanding it has been, for years past, so warmly recommended by very powerful pens, it never has, nor probably ever will, be relished by the generality of farmers."

After this view of the nature of carts in general, and of the particular advantages of single-horse carts; it may be useful to describe the different sorts of carts that are employed in the humour of husbandry.

Close cart, a name given to all such carts as have no ladders, rails, or wings, attached to them. They are made close by boards, and molly employed in conveying dung, gravel, earth, or such other materials as have considerable weight, in a small compass. By the application of wings or ladders to them, they are however, frequently made to serve the double purpose of conveying heavy clofe matters as well as those of a light bulky nature. This sort of cart is represented at fig. 4, Plate 111. of Agriculture.

Corn cart, is that sort of cart which is only placed occasionally on wheels, for carrying hay, corn in the straw, or other bulky articles: carts of this kind are generally composed of flatiron rods, and spars, without decks, but broader and much longer than the close cart, that they may hold a more bulky load. They call from 30s. to 50s. in Scotland, but in England they are considerably higher. They are commonly employed in the northern parts of the kingdom for carrying hay, grain in the straw, and other similar bulky materials. A cart of this sort is shown at fig. 4, Plate 111.

Cone cart, a cart of the close kind, so denominated from the body-part rolling on a sort of frame, to which it is kept by means of staples, or other contrivances, through which a call-bar, or wooden pin, is put, by which it is confined, and which can be readily removed when the load is to be either partially or wholly discharged. Carts of this sort are generally used in putting dung upon land, and are convenient for many other purposes in husbandry. See fig. 3, Plate III.

Drag cart, a sort of cart invented by lord Somerville, which is connected with a drag, or some other contrivance, for checking, or regulating the rapidity of the motion in going down hills, or other declivities. A full account of this cart has been given in the second volume of "Communications to the Board of Agriculture." At fig. 5, in Plate 111, is a perspective view of a cart of this sort to be drawn by two strong oxen, by a pole, yoke, and bows, made to carry 45 cwt. In the front of this figure is represented the method which his lordship has contrived for adjusting the position of the centre of gravity of the load, to prevent its preloading too much on the cattle in going down hill, the front of the cart being elevated by means of a toothed rack screwed to the front of the cart, and worked by a pinion, and the handle, a, immediately connected with the pole, e. By means of this pinion and rack, the front of the carriage is elevated more or less, in proportion to the declivity of the hill, by which means the weight of the load is made to bear more on the axis, and less on the necks of the oxen.—On the side view of this cart is represented the manner of applying the friction-drag, which is made to press more or less on the side of the wheel, according to the steepness of the descent: —bb is the friction-bar, or drag, the one end of which is connected with the tail of the cart by a small chain, and the other end to the front, by means of a toothed rack, bd, which catches on a staple in the front of the cart, by which the friction-bar is made to press on the side of the wheel, more or less, at the discretion of the driver: the notches or teeth in this rack, it is observed, should be as close to each other as circumstances will permit. And in this representation, the friction-bar is, he remarks, applied lower upon the wheel than was at first proposed, in order to divide the pressure and friction more equally on the opposite sides of the wheel, so that the pressure on each is diminished, the risk of over-heating and destroying the friction-bars is also rendered less, than if the whole pressure was applied in one point on the top of the wheel. The weight of the iron-work of this cart is 2 cwt, 20 lb. This is unquestionably a useful contrivance for hilly districts. At fig. 3, in the same Plate, is a side view of a cart of this kind of a smaller size, to carry 25 cwt. and to be drawn by one or two small oxen, with the friction-drag, bb, out of use; and representing another and more simple method of adjusting the centre of gravity of the load to the declivity of the descent: ab is part of the arch of a circle, whose radius is nearly equal to its distance from the axis of the cart, and having several holes in it, through which a strong iron pin is put, to keep
the body of the cart at any desired inclination with the pole:—\(1\), a small chain to prevent the body of the cart being thrown too far back, through the carelessness of the driver in adjusting it; \(1\), the upper flange of the cart, for carrying bulky loads.—The weight of iron in this cart is \(1\) cwt. 30 lb. This is a very useful, neat, light fort of cart for many purposes.

The advantages of the friction-drag, and other contrivances in this cart, according to the ingenious account of Mr. Cumming, contained in the same volume, are,

1. The method, which is equally simple and expedient, of adjusting the centre of gravity of the load, so as to have a proper bearing on the horses or cattle in going down hill, the advantage of which must be obvious to every man of science, more especially with bulky loads, in which the centre of gravity lies high.

2. The method of applying friction to the side of the wheel to regulate the motion of the carriage in going down hill (instead of locking the wheels), the advantages of which method appear to be as follow: namely, 1st. The pressure and degree of friction may with great expedition be adjusted to the steepness of the declivity, so that the carriage will neither press forward, nor require much exertion to make it follow the cattle. 2dly. The friction is so applied to the wheel, that a given pressure will have twice the effect in retarding the progress, that it would have if immediately applied to the body of the carriage, or to the axis: and by applying the friction on both sides of the wheel, the risk of heating and destroying the friction-bar is much less than if the same degree of friction was applied in one place. 3dly. This apparatus is so conveniently placed, that it can be instantly applied or adjusted, without stopping the carriage, or exposing the driver to the same danger as in locking a wheel. And, 4thly. This useful contrivance, in which he lays simplicity and ingenuity are so happily blended, will assume yet greater importance when applied to both the hind wheels of waggons, by which means the reliance may always be proportioned to the steepness of the declivity, the tearing up of the road prevented, the unnecessary exertion of the cattle in drawing the locked carriage down hill avoided, the danger to which the driver is sometimes exposed in locking the wagon wheel totally avoided, and the time now lost in locking and unlocking the wheel saved to the proprietor." These are certainly advantages of much importance in many districts where the roads are hilly.

At figs. 7 and 8 in the same Plate are views of carts to be drawn by a single horse, by shafts. By an attentive comparison of those drawn by shafts, with those that are drawn by the yoke and bows, the superiority of the pole to the shafts, and the advantage of making the cattle to draw by the yoke in preference to drawing by the forehead, become evident. When cattle draw by the shafts, says his lordship, the one before the other, it is impossible for the driver to know that each exerts an equal force, so as to contribute equally to the draught; but when they draw by the pole and yoke, the point of draught being in the middle of the yoke, when the beasts draw equally, the yoke will stand square with the pole, and the position of the yoke will always enable the driver to discover the defaulter, and to bring him to a proper exertion: it is, he says, this harmony of draught, and equality of exertion, that gives so great advantage to drawing by the yoke, that it is scarcely possible to say what weight of load two good large oxen can draw on a level road." The powers of cattle drawing by the forehead, on lord Shannon's elate, are recorded by Mr. Young and Mr. Billinglsey:—an ox of the late Mr. Tatterfall, near Ely, drew four tons of wood on a level surface without apparent difficulty. What then, says he, "might not be expected from the equal exertion of two such powerful animals, acting at the equal ends of the same yoke?" Notwithstanding these judicious observations, further trials are wanting with respect to the best modes of draught.

**Hay Cart**, a cart made use of for conveying hay from the field; it is constructed in the same way as that made use of for corn. See Corn Cart.

**Quarry Cart**, is a light, strong fort of cart, employed in quarries. Carts for this purpose are variously constructed, according to the nature of the materials to be conveyed by them. When flat stones of great length and breadth are to be carted, they should be low, for the convenience of loading and unloading; and at the same time very firmly put together.

It is stated in the Agricultural Survey of the County of Perth, that "Mr. Mylne, of Mylnfield, employs a cart of a particular construction in his quarry of Kingoodie, which merits the attention of those who have works of a similar nature. This cart has a bend in the axle, which brings it within fourteen inches of the ground, although moving on wheels more than five feet high. The cave with which it is drawn, loaded, and unloaded, is superior to the common cart, in the proportion of 7 to 3." It is seen at fig. 9, in Plate III. He also uses in this quarry "a cart for carrying very large stones, such as mill-stones, &c. which is drawn as easily upon wheels of two feet two inches in height as upon wheels of a greater diameter. In this cart the axle is only about five feet long, so that the wheels run under the body of the frame, which is flat, and may be made of any breadth or length required."

**Single horse Cart**, that light fort of cart in which only one horse is employed. The term is made use of to distinguish them from those of the large kind, in which three, four, or even a greater number of horses are made use of. Carts of this small construction are extremely useful for all the various little purposes of cartage about the farm, as has been fully shown above. See figs. 3, 7, and 8 in Plate III.

**Three wheeled Cart**, a kind of cart that is constructed with three wheels, one being commonly placed in the middle, before, and generally of a smaller size. Carts of this sort are mostly close, and used when great quantities of earth or other materials are to be conveyed at once to some distance.

**Carts, laws relating to.** By 13 Geo. III. c. 58, no cart, having the sole or bottom of the fellies of the wheels of the breadth of nine inches, shall be drawn with more than five horses; and no cart, having the said sole the breadth of fix inches, shall be drawn with more than four horses; and those of les breadth than fix inches shall not be drawn with more than three horses, under a penalty on the owner of 5l., and on the driver (not being the owner) of 10s. for every horse above the stipulated number: the information to be laid within three days and the action commenced within one calendar month after the offence committed. Exceptions are admitted in favour of carriages, moving upon wheels or rollers of the breadth of 16 inches on each side, with flat surfaces, and such as judiciously allow by licence to be drawn up steep hills, or on roads that are not turnpike, or in deep snow or ice, or carrying any one stone, block of marble, cable rope, piece of metal, or ammunition and artillery for his majesty's service. Two oxen or horned cattle are considered in the contemplation of this act, as one horse. Moreover it is enacted by 6 Geo. I. c. 6, that no person in London and Westminster, or within
10 miles, shall carry at one load in carts or waggons having their wheels fixed with iron, more than 15 sacks of meal or flour bulks each, nor more than 12 quarters of malt, nor more than 750 bricks, nor more than one hundred weights, on pain of forfeiting any one of the horses, with geers, bridles, &c. And by 18 Geo. II. c. 37, wheels of every cart, car, or dray, within the bills of mortality, shall be five inches broad in the felly, and not wrought about with iron, nor be drawn with more than three horses, after they are up the hills from the water-side, under a penalty of 40s.; but this act does not extend to any country cart or waggon, that shall bring any goods, or shall carry any goods half a mile beyond the paved streets of the said cities and places. Any person, within the said limits, using any cart, car, or dray, having the wheels full five inches broad, when worn, may have the fame bound round with tine of iron, provided it be five inches broad, and made flat; and not set on with rose-headed nails. No person shall drive any cart, within the said limits, unless the name of the owner, and number of such cart, &c. be placed in some conspicuous place of the cart, &c.; and his name be entered with the commissioners of hackney-coaches, under the penalty of 40s. and every person so convicted of having broken the same shall be liable to the penalty of 40s.

On changing property, the names of the new owners are to be affixed, and to be entered with the commissioners of hackney-coaches, 30 Geo. II. c. 22. And stat. 24 Geo. III. st. 2, c. 27, compels the entry of all carts driven within five miles of Temple-bar. By 13 Geo. III. c. 78. §. 11. a person, who leaves any cart or other carriage, &c. in any high-way, beyond the reasonable time allowed for loading or unloading, so as to obstruct the passage of any other carriage, &c. shall forfeit 40s. By 1 Geo. flat. 2, c. 57, by 24 Geo. II. c. 43, and, more generally, by 13 Geo. II. c. 78, it is enacted, that if the driver of any cart, car, dray, or waggon, shall ride upon any such carriage in any street or highway, not having some other person on foot or on horseback to guide the same (such carriages as are conducted by some person holding the reins of the horse or horses drawing the same excepted) — or if the driver of any carriage whatsoever, on any part of any street or highway, shall by negligence or wilful misbehaviour cause any hurt or damage to any person or carriage passing or being upon such street or highway — or shall quit the highway and go on the other side of the hedge or fence inclosing the same; or wilfully be at such distance from such carriage, whilst it shall be passing upon the highway, that he cannot have the direction and government of the horses or cattle drawing the same; or shall, by negligence or wilful misbehaviour, prevent, hinder, or interrupt the free passage of any other carriage, or of his majesty's subjects, on the said highways; or if the driver of any empty or unloaded waggon, cart, or other carriage shall refuse or neglect to turn aside and make way for any coach, chariot, chaise, loaded waggon, cart, or other loaded carriage; or if any person shall drive, or act as the driver, of any such coach, poll chaise, or other carriage let for hire, or waggon, wagon, or cart not having the owner's name (as by this act is directed) painted thereon, or shall refuse to discover the true christian and surname of the owner of such respective carriage; he shall on conviction by confession. view of the justice, or oath of one witness, before one justice, forfeit any sum not exceeding 10s., in case such driver be not the owner of such carriage; and if he be the owner, then any sum not exceeding 20s.; and in default of payment he committed to the house of correction for any time not exceeding one month, unless the same be sooner paid. And every such driver offending in either of the said cases, may by authority of this act, with or without any warrant, be apprehended by any person who shall see such offence committed, and shall be immediately conveyed or delivered to a constable or other peace officer, to be conveyed before a justice, to be dealt with according to law. And if any driver, in any of the cases aforesaid, shall refuse to discover his name, the justice may commit him to the house of correction for any time not exceeding three months, or may proceed against him for the penalty by a description of his person and the offence, and compelling in the proceedings that he refused to discover his name.

And for the better discovering of offenders, the owner of every waggon, wagon, or cart, and also of every coach, poll chaise, or other carriage, let to hire, shall cause to be painted, upon some conspicuous part of his waggon, wagon, or cart, and upon the panels of the doors of all such coaches, poll chaises, or other carriages, before the same shall be used in any public highway, his christian and surname and place of abode, in large legible letters; and continue the same thereupon so long as such carriage shall be used upon any highway; and the owner of every common flagge waggon or cart shall, over and above his christian and surname, cause to be painted on the part and in the manner aforesaid, the following words, common flagge waggon or cart, as the case may be. And every person using any such carriage as aforesaid upon any highway, without the said names and descriptions respectively, or causing to be painted thereon any fictitious name or place of abode, shall forfeit not exceeding 5l. nor less than 20s.

"Taxed carts," constructed, kept, and used under the regulations of the stat. 43 Geo. III. c. 99, are exempted from the annual duty of 5l. 5s. charged for carriages with less than four wheels and drawn by one horse. Such carriages are thus described: they shall be built wholly of wood or iron, without any covering other than a tilted covering, and without any lining or springs, made of iron, wood, leather, or other materials, and with a fixed seat, without flings or braces, and without any ornament whatever, other than paint of a dark colour, for the preservation of the wood or iron only, and which shall have the words "a taxed cart," and the owner's christian and surname and place of abode, marked or painted on a black ground in white letters, or on a white ground in black letters, on the outside of the back panel or back part of such carriage, in words at full length, and of a breadth in proportion, and the price of which (repairs excepted) shall not have exceeded, or the value thereof shall not at any time exceed the sum of 1s. 11d. For such a carriage kept by any person for his own use, and not for hire, the annual duty to be paid is 1l. 5s. The exemption from all duties specified in the forefaind act extends to any cart kept to be used wholly in husbandry, or in the carriage of goods in the course of trade, and whereas the name and residence of the owner, and the words "common flagge cart" shall be legally painted; although the owner, or his or her servant, shall occasionally ride therein or thereon when laden, or when returning from any place to which, or when going to any place from which any load shall have been or shall be to be carried in such carriage, or for conveying the owners thereof or their families to or from any place of divine worship on Sunday, or on Christmas-day, or on Good Friday, or on any day, appointed for a public fast or thanksgiving, or for carrying persons going to or returning from the election of members to serve in parliament.

Cart, in Artillery. See Carriage.

Cart-bate, in our Ancient Cuffions, denotes wood to be employed in making or repairing instruments of husbandry.
C A R

Cart-ladder, a kind of rail or rack, placed occasionally at the head, sides, and tail of a cart to make it hold a larger quantity of hay, straw, or other familiar bulky material. Rails of this sort are framed and made very strong.

Cart-lidges, a small anti-foune for sheltering carts from the weather. Farmers should be very careful to place their carts, &c. under proper shelter, when out of use, as they will last much longer by this means than if left exposed in the yard to the effects of the weather; for, as they are thus sometimes wet, and sometimes dry, they soon rot, and become unfit for use. The shut and nallines should also be constantly washed off before they are laid up in these places. These sheds should always be as close to the farm yards as possible, for the sake of convenience.

Cart-rake, a provincial term applied to the cart-track, or furrow made by the wheels of the cart.

Cart-wright, a name applied to a person whose business is to make carts, waggonis, &c. generally called a wheelwright.

Cart-water, in Geography, a river of Scotland, which runs into the Clyde, 3 miles N. of Paisley.

CARTA, Ital. literally means paper; but it is used in Muse for a folio, a leaf, or page of musical characters.

CARTA, in Ancient Geography, a town of Asia, in Hircania, according to Strabo.

CARTAGO. See CARthage.

CARTAGO Nova. See CARTHAGena.

CARTAGO, in Geography. See CARTHAGO.

CARTAL, a town of European Turkey, in Becharabia, situate on the Danube; 28 miles W. of Ipsmal.

CARTAMA, a town of Spain, in the province of Granada, seated on an eminence; 4 leagues N.W. of Malaga.—Also, a town of Spain, in the province of Grenada, 6 leagues S.W. of Alhama.

CARTE, THOMAS, in Biography, a learned and laborious English historian, was the son of the Rev. Samuel Carte, vicar of Clifton upon Dunsmoor, in Warwickshire, and born there, or at least baptized there by immersion, on the 23d of April, 1686. In 1698, soon after he had entered the 11th year of his age, he was matriculated in the university of Oxford, and he was afterwards incorporated at Cambridge, where he took his degree of master of arts in 1705. Having entered into holy orders, he became reader of the abbey-church at Bath; and in consequence of a sermon preached on the 30th of January 1713-14, and vindicating the character of king Charles I. from the slanders cast on his memory with regard to the Irish rebellion, he was engaged in a controversy with Mr. Chater, a dissenting minister at Bath and father of the celebrated Dr. Samuel Chandler. This controversy occasioned his first publication, entitled “The Irish Malaface, set in a clear Light, &c.,” which was afterwards inserted in “Somers’s Tracts.” On the accession of George I. he fruited taking the oaths to the new government, and assumed a lay habit. In 1715 he was suspected of being concerned in the rebellion, and in order to elude orders that were issued for apprehending him, he was for some time concealed in the house of a clergyman at Colehill. Whilst he afterwards acted as secretary to bishop Atterbury, he incurred suspicion of being a party in the conspiracy attributed to that prelate, and being charged with high-treason in 1722, a reward of 1000l. was offered for seizing his person. He fortunately escaped to France, and resided in that country several years under the name of Philips. At this time he had access to many persons of learning and rank, and to several libraries, and thus had an opportunity of collecting materials for an intended English edition of the history of Thuanus. His collections were purchased by Dr. Mead, and employed in Buckley’s splendid edition of that work, which appeared in 1733. By the interest of queen Caroline he obtained permission to return to his own country, and soon after engaged in his important work, “The History of the life of James duke of Ormonde” comprized in 3 vols. fol. and published in 1735-36. This work contained useful materials with respect to the history of those times, and particularly relating to the affairs of Ireland, of which Dr. Leland and other writers have avoided themselves; but as it displayed the author’s attachment to arbitrary principles of government, it raised his reputation with the Tory party. As he and those with whom he was more immediately connected disapproved the principles of Rapin’s History of England, and thought it chargeable with many errors, he announced his intention of writing a new history; and having, in 1738, printed an account of the materials as well as the encouragement that were necessary for the completion of his plan, he obtained subscriptions, or reason to expect them, to the amount of 600l. per annum. Accordingly he commenced his researches in the libraries of Cambridge, retired for some time in the house of Sir John Hinde Cotton, and employed himself in arranging his large collection of pamphlets and journals. In 1744, when the Habesc Corpus act was suspended on account of apprehensions from the Pretender, Carte was again inspected, and being taken into custody underwent an examination; but as no evidence appeared against him, he was soon discharged. Deriving from this circumstance additional encouragement to prosecute his history, and a handsome subscription from the city of London, voted by the common council, as well as from some of the London companies, he was enabled to complete the first volume in folio, terminating with the death of king John, towards the close of the year 1747; but the introduction of an absurd story concerning a man who went from Somers-shire in 1716 to Avignon to be touched by the Pretender for the king’s evil, and who was said to have been cured, excited his credulity and want of judgment to such a degree, that his history sunk into disrepute, and the author was dis-appointed with regard to several subscriptions which he had reason to expect. However, he persevered, and published two additional volumes in 1750 and 1752; and the fourth, which was posthumous, appeared in 1755, and he continued the history to 1754. In this history, which in point of style is indifferently written, much useful information, procured by indefatigable researches, is blended with inveterate prejudice. Mr. Carte was the author of various other works, which are chiefly compilations, collections, and translations. The most considerable is “A catalogue of Gaeceon, Norman, and French Rolls preferred in the Tower of London,” printed in French at Paris, in two vols. fol. 1743. He died at Cadocott house, near Abingdon in Berkshire, on the 2d of April, 1754. His papers are de-potized in the Bodleian library; and they have been perused by the earl of Hardwicke, and also by Mr. Macpherson, who availed himself of them in the compilation of his History and State papers. Mr. Carte was a man of strong constitution, indefatigable in his application to study, negligent with regard to his outward appearance, but when the labours of the day were closed, fond of society, and in conversation cheerful and entertaining. He left a widow, but no children. Nichols’s Anecdotes of Bowyer. Biog. Brit.

CARTE, in Fencing, denotes a thrust with a sword at the inside of the upper part of the body, with the nails of the sword
foward hand upwards. _Low carte_ is a thrill at the infide of
the lower half of the body; the position of the hand being
the fame as in the former.

_Carte Blanche_, a French term, seldom used but in this
phrase, 'To give, or fend any one the _carte blanche_; i.e. to
fend him a blank paper, signed, for him to fill up with what
conditions he pleafes. Much like this is the French _blanc
feve_, a paper without writing, except a signature at the
bottom, given by contending parties to arbitrators, or com-
mon friends, to fill up with the conditions they judge rea-
fonable, in order to end the quarrel.

_Carte Blanche_, in Military Language, is an absolute
power or authority given by a sovereign to a general of
his army to do whatever may appear to him most proper or ad-
visable without waiting for order from his court; or it is
permiiffion granted to a general to act in conformity to his
own will, his knowledge, intelligence, and information, and
according to circumstances, without specific orders from his
chief. A general in confequence of fuch a power conferred
on, and confidence reposed in him, may attack his enemy
in point both of time and manner as he thinks fit, without
having either received a particular fresh order, or waiting for
any.

In ancient times the general of an army had commonly
the power of executing, with the troops under his command,
his own plans and designs. The Grecian, Roman, and
Carthaginian generals had almost always a carte blanche.
But they were answerable to their respective governments
for their want of fuccefs, and they rarely escaped punifh-
ment as criminals when they were unsuccessfiil. And even
the excufing of them from banifhment was a favour, or in-
dulgence, which was regarded as a mark of disgrace or dif-
honour. In modern times the republics of Venice and Ge-
neva have particularly afforded examples of this severity even
towards generals who had gained many victories, and had
rendered essential service to their fates; from which it may
fairly be inferred, that the general who accepts a perfect
carte blanche, is at leaft imprudent, if he is not ambitious.

The Ottoman history also furnishes feveral instances of
generals engaged on their return from campaigns for having
been unsuccessfiil, or defeated.

Scignor de Gordes, governor of Picardy, having engaged
at Guinegale, without the orders of the court, the archduke
Maximilian of Austria, Louis XI. was fo vexed on being
informed, that though his troops had at first the advantage
in the action, they at laft lost it by betaking themselves to
pillage, that he determined his generals should afterwards
undertake nothing of confequence without express orders.
Since the time of that prince, the kings of France, who
have indeed been generally themselves at the head of their armies,
have not granted a carte blanche but very rarely, and only
to generals whose valour and abilities have been frequently
tried and acknowledged.

As mofl of our expeditions are carried on at a great
distance from this country, it is perhaps more neceflary for
fuch generals who command them to have a discretionary
power of acting, than it is for fuch of any other nation.
But none should be invested with fuch authority, or entrusted
with the command and management of fuch distant expedi-
tions but men of approved knowledge, discretion, and capacity.
Had a general of talents been employed with a
fort of carte blanche at the beginning of the American
war, commonly called the American rebellion, he would
probably have fettled it completely in the coufe of a few
months.

The king being generalissimo of all his forces may grant a
carte blanche to fuch of his generals as he either knows, or
supposes to possess great prudence and superior talents. In
like manner the general of an army may give a carte blanche
to a general officer commanding a division of the fame.
When a general possesses all the talents and qualifications
necessary for his situation or employment, his sovereign
ought to confert on him this power or authority in order to
prevent the want of it from retarding, embarrafing, or
crippling his operations. It is neceflary indeed that every
general should have a discretionary power of acting to a cer-
tain degree. One of the great advantages, which a king
capable of commanding his own armies enjoys, is that of
doing what he chooses, and when he chooses, without
losing occasions and opportunities of acting by waiting for
orders. It is for the fame reason useful and advantageous
for a sovereign to be present with his army, if he have even
not the talents necessary for commanding it. For their or-
ders are obtained promptly and expeditiously. Intrigue and
jealousy have not time to operate and produce their baneful
effects; and the general has it more in his power to guard
himself against them.

In engagements, the commander of an army ought to give
only cefide and general orders, leaving a fort of carte blanche,
or discretionary power of acting, with all his general
ennessee, or to matters of detail. For in every action there is an-
almost an infinite number of circumstances, which neither
the commander himself nor the generals under him can foresee,
that require sudden changes of diaption and prompt movement,
which every general should have in his power to direct,
and caufe to be made without waiting for orders.

_Carte geographique_ of Argenville, in Genealogy, the map
conwy, _Cypraea mappa_.

_Carte geographique, Fauve_, in Entomology, the trivial
French name of the European kind of butterfly, called by
Linn. and Fabr. _papilio profa_.

_CARTEIA_, in Ancient Geography, Roccellio, a town in
the southern part of Bactica. Some difference of opinion
has hiftified about its precise situation; but the researches of
ingenious geographers lead us to conclude, that it was
feated at the bottom of the bay of Gibraltar, and that it
was called "Tartessos" by the Greeks, though the Latins
transferred this name to Gades. Some authors have con-
ftimated it with "Calpe," which was at the extremity of
the mountain. Strabo fays that it had been founded by
Hercules, and that it had formerly been called "Heraclea."
This city fuffered much when Cefar pursed the army of
the fon of Pompey, defeated at Munda. Carteia, is it faid,
confubtilt till the arrival of the Moors; and the town, now
called Cadiffion, is faid to be the remains of Carteia.

_CARTEIA_, a town of Spain, in Celtiberia, called by
Polybius Althra.

_CARTEL_, in Military Language, is a particular agree-
ment, or convention between two belligerent powers, and has
commonly only for its objects the exchange or ramon of
prisoners, and the mutual delivering up of each others' defeters at cer-
tain times, and under certain conditions.

There are also cartels agreed on or settled between princes
in time of war, for carrying on commerce without interrup-
tion, notwithstanding bollificities.

_Cartel_ originally signified a placard, or manifello in writ-
ing, posted in public places, for the purpose of notifying,
or announcing its contents.

It comes from the Italian word _cartella_, or the Latin
word _cartellis_, both of which have the fame signification,
being diminutives of _carta_, signifying paper.

The term _cartel_ has also been made use of to denote
the agreement or convention which contained the rules or regu-
lations, that were to be observed by the knights, or che-
valiers.
valiers who jousted and combated at a tournament, or{car}
cavalry.

This name is likewise given to the billet, or note of chal-

lenge which the person offended or infuriated sends to the

aggrieved, requiring him to meet him at the place and time

appointed to give him satisfaction, and settle their quarrel by

single combat.

This term has also been often employed to signify a letter

of defiance, or challenge to single combat. Such letters

were in frequent use, when under the feudal system combats

of this nature were not only practised, but were functioned

and enjoined by princes, and even by bishops and the dignified

clergy as the best method of settling difficult points of law

and controversy that could not easily be otherwise deter-

mined. Such challenges, or letters of defiance, were not al-

ways confined to single combats. They sometimes extended

to small bodies of men of an equal number on either side, and

sometimes even to armies. Rymer gives the cartel which

Edward III. sent to Philip de Valois challenging him to

fight him within ten days before the gates of Tournay, ei-

ther body to body, or one hundred men to a hundred men,

or army to army.

Challenges of this nature, however, took place long be-

fore the existence of the feudal system, and as far back in-

deed as either history or poetry carries us. For instances of

them to be found in Homer, Virgil, and other Greek

and Latin poets, as well as in their historians.

Cartel is also a term used to denote a ship commissioned

in time of war for exchanging the prisoners of any two belli-

gerent powers, or for carrying a requisition or proposal from

to one to the other. The officer who commands her is per-

mitted to carry a single gun only for the purpose of firing

signals.

Cartel likewise denotes a measure of capacity for corn in

diverse parts of France, varying in different places.

CARTENAGA, in Ancient Geography, a town of In-
daia, placed by Ptolemy on this side of the Ganges.

CARTENNA, or CARTENNE, a very considerable city of

Africa, in Mauritania Caesariensis, or the western prov-

cince of the kingdom of Algiers, called Temfian, or Tre-

meccen, situated near the mouth of the river Cartenna,

to the north-east, and S.S.W. of that of the river Chinalaph,

or Shelliff. Piny and Ptolemy mention it. It was a Ro-

man colony, and Augustus settled in this place the fol-

diers of the second legion. Its situation corresponds to that

of Multy-gannim, or Mofigan, and also of Mafagran. The

strength and beauty, says Dr. Shaw, (Travels, p. 16.) of

the walls of Multy-gannim to the N.W. may well allow us

to suppose them to have been formerly a portion of some

Roman fabric. For both Multy-gannim and Mafagran

are so copiously supplied with water; they are so commodi-

ously situated with regard to the fertile and extensive lawns

that are spread far and near behind them; they enjoy, be-

sides, such a delightful prospect of the sea, and of the rich

maritime country that lies in view, to a great distance, on

each side, that, without doubt, they were stations too va-

lable to have been neglected by the Romans. Piny and

Ptolemy place their Cartenna in this direction; and in the

Itinerary we have the same dilation betwixt Arfena and

Cartenna that is found betwixt Arzew and these places.

One or other of them, or both, might have formerly made

up this colony; for, considering that their situations are

nearly contiguous, and that the intervening plantations be-

long indifferently, as perhaps they always did, to both of

them, there is some probability at least that they had like-

wise the same intereil, and were accordingly one and the

fair community, under the name Cartenna, as it is written

in the plural by Ptolemy. See MOSTAGAN.

CARTENNUS, a river of Africa, which discharges it-

self into a gulf of the Mediterranean Sea, N.E. of the port

of Arimania. It is now, as Dr. Shaw conjectures, the Halah,

which fer.

CARTER, in Geography, a new county in the flate of

Tennessee, in North America, formed of a part of the county

of Washington.

CARTERET, John, earl Granville, in Biography, an

eminent statesman, was born in 1659, and educated at

Wellsminster school and Christchurch college, Oxford, from

which he was distinguished for the degree of classical

learning, and also for high principles of government, and

a fondness for constitutional pleasures, which marked the

prospects of his life. Upon being introduced into the House of

Parliament, in 1711, he distinguished himself as a zealous

advocate for the Hanover succession, and was successively

advanced by king George I. to several polls of honour. As a

foreseeable and eloquent speaker, he strenuously supported the

measures of administration during that reign. In 1719 he was

deputed as ambassador extraordinary and plenipotentiary to

the queen of Sweden; and negotiated the peace between that

crown and Denmark, which terminated the troubles of the

north of Europe; and in 1721 he was appointed secretary of

state, which gave him an opportunity of vigorously defending

the bold, yet mealy measures of the existing administration.

Having accompanied the king to Hanover in 1723, he was,

on his return, in the following year, appointed lord lieutenant

of Ireland, and exerted himself in compounding the difficul-

ties in that country, which had been fomented by Swift's

famous Drapier's letters. When Swift expostulated with him

for his prosecution of the printer of those letters, he replied

in a line of Virgil, no lea appropriate as an apology for

many measures of that reign, "Regni novitas me tali cogit

moli's, i.e. the unconcerned state of the throne compels

me to make use of these means. After his return to Eng-

land, in 1726, he continued his firm support to the govern-

ment. After the accession of George II., in 1727, he again

occupied the vice-royalty of Ireland, and conducted the

affairs of government till the year 1730, in a manner that

conciliated contending parties. On this occasion, Swift

wrote an inflammatory vindication of his lordship from the

charge of favouring none but Tories, high church-men,

and Jacobites. After his return to England, he joined the

opposition to Sir Robert Walpole, and in the parliament

contested with his ministry, adopted maxims and language

very different from those which he had avowed and used,

whilst he himself was a member of administration. Having

at length succeeded, in connection with his coadjutors, in

procuring the dismissal of Walpole in 1742, he became se-

cretary of state, and supported measures similar to those

which he had been lately censuring. In 1744, upon the death

of his mother, he succeeded to the titles of viscount Carter-

cart and earl Granville. After a course of various political

changes, he closed his life the 2d of January, 1763, in the

73d year of his age. Although he possessed disinterested

talents and acquirements, his temper was so ardent and

overbearing, that he was fitter for being the minister of an

absolute monarch than of a limited sovereign. Ambitions.

and fond of sway, he was neither mercenary nor vindictive;

and the elevation and dignity of his genius were exalted by

his confidence and presumption; so that he is said never to

have doubted. Learned himself and an encourager of liter-

ature, he particularly patronized Dr. Taylor, the celebra-

ted Grecian, and Dr. Bentley. In social life he was plea-


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CAR

CARTETT, in Geography, an island in the Southern Pacific Ocean, discovered by captain Carteret in Augušt 1567, 8. lat. 30° 3′. E. long. 145° 14′. CARTETT, a maritime county of New-Haven district, in the flate of New-Carolina, in North America, on Cape and Pandoufoue sounds. It contains 17,712 inhabitants, including 7,113 slaves. Its chief town is New-York.

Carterette Harbour, a bay on the south-east coast of New-Holland. 3. lat. 40° 49′ 5″. E. long. 150° 45′ 36″. This harbour forms a sort of basin, where the clouds, loaded with water, after passing over the high mountains of New-Holland, experience a chill, which prevents the air from supporting them. To this circumstance are owing those excessive rains, which render the anchoring-place far from desirable to navigators. Nevertheless, this harbour furnishes plenty of good water, which may be procured with great facility: but the wood obtained in this place introduces into the ships a prodigious number of leprosions and scolopendres, of the species called "scolopendra mortifera," which are very troublesome. This harbour affords no refreshments. The tides take place once a day, and rise only about 6 feet. The thermometer, observed at noon in the middle of July, varied from 10° to 21°; and the barometer from 28 inches 147 4th line to 28 inches 147 5th line. Voyage in search of La Peroufe, vol. i.

Carterette Point, the N.W. extremity of the island of Egmont, in New-Guernsey. 8. lat. 10° 42′. E. long. 163° 70′.

CARTERIA, in Ancient Geography, an island of Alia Minor, near Smyrna, according to Pliny.

CARTEROMACO, or CARTEMACUS, Scipio, in Biography, a learned Italian, whose proper name was Fortignera, was born at Pifio in 1467; and having studied in his native city at a college founded by his family, at Rome, and at Florence, where he learned Greek under Angelo Poliziano, and having passed some years at Padua, he was appointed by the republic of Venice, in 1500, with a liberal salary, to teach the Greek language to the Venetian youth. Upon an invitation to Rome by pope Julius II, he was placed by this pontiff with his nephew, cardinal Galetti de la Rovere; and upon the death of this cardinal, he attached himself to cardinal Francis Aldoino, who was killed at Ravenna in 1511. His next patron was cardinal John de Medici, afterwards pope Leo X.; but his rising expectations were suddenly frustrated by death, at the age of 46, in 1513. Scipio was equally distinguished for morality and learning; and both these qualities are ascribed to him in a very eminent degree by Erasmus (Epift. 471.), who consulted him and Marcus Mufurus upon such difficulties as occurred to him in the explication of Greek proverbs. His principal works are, "A Latin Oration in praise of Greek learning," Venice, 1504; "A Latin Translacion of the Greek Oration of Arifordes in praise of the City of Rome," Venice, 1518; "An Edition of Polyan's Geography," Rome, 1507; and various prefaces, epigrams, and letters in Greek and Latin, inserted in other publications. Gen. Diet. Tiraboschi.

CARTERON, or CARTERUM, in Ancient Geography, a town of Afgian Sarmatia, situated on the coast of the Euxine sea, according to Ptolemy.

CARTES, RENT-DER, in Biography, an eminent philosopher, and founder of a numerous sect, called Cartesians, was a native of France, the descendant of an ancient and noble family, and born at La Haye in Touraine, on the 31st of March 1556. As he discovered in his infancy an eager curiosity to inquire into the nature and causes of things, his father called him "the Philosopher," and placed him, at the early age of 8 years, under the tuition of a relation in the Jesuits' college at La Fleche, where he made an uncommon proficiency in the learned languages and polite literature, and formed an intimate acquaintance with several persons, who afterwards became eminent in the republic of letters, particularly with Merfenne. After spending 5 years in the diligent study of languages, and in reading the principal parts, orations, and orations, he directed his attention to mathematics, physics, and morals; but disapproving the mode in which those sciences, and more especially the two latter, had been hastily taught, he formed a plan of study for himself, and sketched out a concise syllem of rules or canons of reasoning, in which he followed the strict method of the geometricians. Dissatisfied, however, with the course of study which he was pursuing, he left the college at the close of 8 years, and returned to his parent, lamenting that he had derived no other benefit from his past application than a fuller conviction that he had hitherto known nothing with perfect clearness and certainty. He therefore determined to throw aside his books, and to seek knowledge in the study of himself and of the great volume of nature. Having spent some time in the city of Rome, where he employed himself in learning to ride and fence, and other exercises preparatory to a military life, he proposed to devote himself to the profession of a soldier; but his constitution being feeble and unfit for the fatigues of this kind of life, his father sent him to Paris in 1613, and confiding in his discretion, left him to his own uncontrolled direction. Here the love of pleasure and a propensity to gaming would probably have wholly diverted his attention from the pursuits of literature, if he had not fortunately renewed his acquaintance with Merfenne, and other learned persons, who reclaimed him from the frivolity and folly to which his time was devoted, and engaged him to renew his application to the study of mathematics, which he professed in retirement for the space of about 2 years. But still unsteady in his purpose, and dissatisfied with the result of his speculations, he again laid aside his books, and determined to embark in the military profession, under a notion that he should thus enjoy favourable opportunities for gaining a knowledge of the world. Accordingly he departed for Holland in 1616, and entered himself as a volunteer in the Dutch army. Whilist he regularly performed his military duty, he spent his intervals of leisure in study; and during the encampment of the army at Breda, he solved a problem in mathematics to the satisfaction of Beeckman, an eminent mathematician, principal of the college of Dort, and he also wrote a treatise on music, which was printed at Utrecht in 1650, 4to., and at Amsterdam in 1656, 4to., under the title of "Compendium Musices," of which an English translation was published at London in 1653. During his stay at Breda; he also laid the foundation of several of his works, and is said to have composed a philosophical dissertation, in which he attempted to prove that brutes are automata, or mere machines. See BRUTUS. In 1619 he quitted the Dutch service, and entered as a volunteer in the army of the duke of Bavaria. Whilist he remained in winter-quarters, he had many intervals of solitary leisure, which he employed in a course of meditation upon important subjects; and as he was still perplexed with doubts and difficulties, he had recourse for satisfaction to the Roscruccans, who boasted of divine inspiration; but failing to find any one who could unfold to him the mysteries of this sect, he returned from his short excursion into the regions of enthusiasm to the humble path of rational inquiry, and preferring the society of learned men to that of his military brethren, he appeared more like a philosopher than a soldier. Having been present at several sieges, and having, in 1621, made the campaign in Hungary, under the count de Bucquoy, who was killed that year, he abandoned
abandoned the military profession; and after a tour through the northern parts of Germany, he returned, in 1622, to his own country, with no other profit from his travels, as he himself confesses, than that they had freed him from many prejudices, and rendered his mind more fit for the reception of truth. Some time after he fixed his residence at Paris, where he cleared himself from the imputation of being a Rofeniusian, and applied to the study of mathematics, with a view of discovering general principles of relation, measure, and proportion, applicable to all subjects, by means of which truth might be investigated with certainty, and the boundaries of knowledge enlarged. But not succeeding to his wishes, he turned his attention to ethical inquiries, and attempted to raise a superstructure of morals on the foundation of natural science; being of opinion, that the best means of discovering the true principles and rules of action, is the contemplation of our own nature, and the nature of the world around us. This investigation in course of time produced his treatise "On the Passions," or "Traité des Passions de l'Amé," written in 1646 for the use of the princess Elizabeth of Bohemia, and printed several times in the 17th century. It was published at Amsterdam in 1655 and 1656 in 4to. From the physical nature of the passions he deduces his principles of morals; and his doctrine on this subject is as follows: "Whatever happens, is called passion, with respect to the subject to which it happens; and action, with respect to that to which it causes it to happen. Nothing acts upon the mind more immediately, than the body to which it is joined; whence what is passion in the mind, is action in the body. Heat, and the motion of the limbs, proceed from the body, and thoughts from the mind; but the mind cannot give motion and heat to the body. The more vivid and subtle parts of the blood, which heat rarifies in the heart, are incessantly entering into the cavities of the brain, and form animal spirits, which are in the brain separated from other less subtle parts of the blood. These animal spirits, which are corporeal, excited as by the soul itself, so also by the action of external objects upon the senses, are the immediate cause of all the original motions of the body. Whence all the limbs may be moved by means of the objects of sense, and the animal spirits, without any action of the soul. Nothing is to be attributed to the soul but thoughts: and these are of two kinds: active, or volition, including desire and aversion; and passive, including intelligence, perception, and feeling, or passion."

"The soul is united to all the parts of the body, but its chief functions are exercised in the pineal gland of the brain, where it receives notice of the impressions made upon the senses, and whence it sends forth animal spirits through the nerves, which put the muscles into motion. The passions are feelings of the soul, produced and continued by the action of the animal spirits; the chief effect of the passions is, to excite the soul to volition. All volition is in its nature free, and consists in causing the gland, with which it is intimately connected, to move in that manner which is most suitable to produce an effect corresponding to the volition. Judgment comprehends not only the perception of the understandings, but the effect of the will, and it is from the abuse of its natural liberty of ascertaining or not ascertaining to a proposition that error springs. The soul, in the act of recollection, exercises a volition by means of which the pineal gland inclines itself successively this way and that way, and impels the animal spirits to different parts of the brain, till that part is found upon which the object which we wish to recollect has left traces.

"The soul of man, which is one, is both sensitive and rational; and the conflict between its inferior and superior parts is nothing else but a struggle between the motions which the body, by means of its animal spirits, and the soul, by its own volition, are at the same time endeavouring to excite in the pineal gland. By the result of this conflict, every one may judge of the strength or weakness of his soul. The soul acquires the dominion over the body by means of firm and clear decisions concerning good and evil, produced by the contemplation of truth, which it determines to follow without suffering itself to be seduced by present passion. The passions belong to the body, and are to be imputed to the soul only as it is united to the body. Their use is, to excite the mind to exert those volitions which are necessary to the preservation or perfection of the body, and the attainment of that which is in its nature good. All the passions are useful, and only become injurious by excess. The general remedy against the excess of the passions is, to consider all the appearances which they present to the imagination as deceitful, and to polipone volition and action till the composition which they have excited in the blood is appeased, or where immediate action is necessary, to follow reason in opposition to passion. Since nothing beyond our own thoughts is absolutely in our own power, it is wiser to endeavour to subdue ourselves than fortune, and to change our own defects than the order of the world."

But to return from this digression, Des Cartes having been employed for some time in the studies above recited, he left Paris, and took a journey to Italy, where he spent about 2 years, conversing with eminent mathematicians and philosophers, and informing himself concerning various objects in natural history. After his return to Paris, he found his studies so much interrupted, and his mind remained in so sceptical a state, that he was unable to pursue any regular plan of life; and, therefore, in 1629, he determined to withdraw to some more retired situation, where, without the interruption of visitors, he might have leisure to complete his grand design of forming a new system of philosophy. In order to prevent any interference on the part of his friends from diverting him from the execution of his purpose, he left Paris without communicating his intention to any; and none, except his friend Merlenne, knew for some time the place of his retirement. Having transiently visited several towns of Holland, he at last fixed upon Egmond, a pleasant village near Franeker in Friesland, as the place of his fixed residence. Here he prosecuted his philosophical labours, and enjoyed the satisfaction of observing how much he engaged the attention of the learned world. In this state of retirement, he employed himself in investigating a proof from reason, independent of revelation, of the fundamental points of religion, viz. the existence of God, and the immortality of the soul, and also in other important metaphysical speculations. The result of these speculations afterwards appeared in his treatise entitled "Meditations de primi Philosophia, &c." and printed at Paris in 1641, 8vo.; a second edition was printed at Amsterdam, in 1642, 12mo. Another edition was published at Amsterdam, in 1719, 8vo. A French translation was printed at Paris, in 1647, 4to.; a second edition appeared at Paris in 1661, 4to.; but the best is the third edition, divided into articles, with summaries, by R. F. i.e. René Felé, doctor of physic of the faculty of Angers, and printed at Paris in 1675, 4to. Whilst Des Cartes remained in Friesland, he pursued the physical inquiries which he had begun in France; and these researches gave occasion to his "Découvre de Meteoros," which he published some years after. After his removal to Amsterdam, he directed his industrious attention to medicine, anatomy, and chemistry; and
and he spent a whole winter in dissecting animal bodies, and in chemical operations. About the year 1630 or 1631, he made a short visit to England; and in the neighbourhood of London he employed himself in observations on the variation of the compass. In the spring of the year 1633 he removed to Deventer, where he completed several works which were left unfinished, and resumed his studies in philosophy, in the summer following he finished his "Treatise of the World," which contained an abridgment of his natural philosophy: but when he heard in what manner Galileo had been treated by the court of inquisition, he was deterred from publishing it, and concealed his opinion concerning the true system of the world. An abridgment of this treatise was published at Paris in 1644, 4to., under the title of "Le Monde des Cartes, &c." and a correct edition of it in 1647, 4to., at the end of Des Cartes's "Traite de l'Homme." It is printed in Latin in his "Opera Posthuma." The treatises of Des Cartes made their full appearance in the schools at Deventer in 1633, where they were introduced by the professor of philosophy, Henry Rorer, a learned man, and an intimate friend of Gassendi. In the following year he returned to Amsterdam, and soon after took a journey into Denmark, and the lower parts of Germany. In 1635 he went to Leewarden in Friesland, where he remained till the year 1637, and wrote his "Treatise of Mechanics," published in Latin in his "Opera Posthuma." In the same year he published his four treatises concerning "Method," "Dioptrics," "Meteors," and "Geometry." These were printed in French at Leyden in 4to. and published at first without his name. The three first were translated some years later into Latin by Burcellius, which translation was revised by Des Cartes; and they were published under this title, "Renati Des Cartes Specimina Philosophica, &c." Amst. 1644, 4to. and 1656, 4to. Van Schooten, professor of mathematics at Leyden, afterwards translated his "Geometry" into Latin, adding his own commentaries and the notes of Mon. de Beaune. This translation, entitled "Renati Des Cartes Geometria, &c." was published at Leyden in 1649, 4to. and with the "Compendium Musicae" at Frankfurt on the Main in 1655, 4to.

In his treatise of "Method," Des Cartes lays down the following rules for the discovery of truth, which are derived from the practice of geometericians. Nothing is ever to be admitted as true, which is not certain, or evident known to be so; that is, in judging of truth all prejudice and preconception are carefully to be avoided, and nothing more is to be admitted in the conclusion, than what appears to the understander to distinctly and clearly, that it cannot possibly be doubted. Difficulties must be accurately examined, and divided into so many parts, as may be most convenient for their easy solution. In proving any truth, the ideas are always to be brought forward in a certain order, beginning from the most simple and most easily known, and advancing, by regular steps, those which are more complex and difficult. All the parts of a demonstration should be distinctly numbered, that the relation of each to the whole may be clearly seen, and that it may be certainly known that nothing is omitted.

When the specimina of his philosophy in the above-mentioned four treatises appeared, the number of his followers and admirers increased; and his new doctrine had also many opponents. At Utrecht, Leyden, and Amsterdam, and in other Dutch schools, the Cartesian doctrines were zealously espoused by many learned men; while several theologians, alarmed at the idea of innovation, strenuously opposed them, and even attempted to subject their author to the confines of the civil magistrate. In Great Britain, the Cartesian doctrine gained such a degree of credit, that for Charles Cavendish, brother to the earl of Newcastle, invited Des Cartes to settle in England; nor did he appear disinclined to accept the invitation, when he was assured that the king was a Cartesian in his heart. Charles I. indeed gave him reason to expect a liberal appointment; but the civil war frustrated the design, and Des Cartes remained in Holland. In his native country his doctrine was at first well received; but a strong party among the Jesuits combined against it; and a violent contest was long kept up between the Jesuits and the Cartesians. In the course of these disputes, Des Cartes himself appeared earnestly desirous of becoming the father of a sect, and discovered more jealousy and ambition than became a philosopher.

In 1641, Des Cartes was invited to France by Louis XIII. upon very honourable conditions; but no proposal could induce him to quit his retirement. It appears, however, that, during his residence in Holland, he made three visits to his native country, viz. in 1645, 1647, and 1648, and that he was amply paid with the promise of an annual pension of 3000 livres, which he never received. Having, in 1641, published his "Meditations," which occasioned a controversy with Voss, rector of the university of Utrecht, he afterwards visited France, where he found the edition of his "Principes," and the Latin translation of his essays finished, and the copies sent from Holland. His "Principes" were dedicated to his illustrious disciple, Elizabeth, princess Palatine daughter of prince Frederic V., elector palatine, and king of Bohemia. The edition of his "Principes" was printed at Amsterdam, by Elsevir, in 1644, 4to. under the title of "Principia Philosophiae," and a French translation, by the abbé Picot, revised by himself, was published at Paris in 1647, 1650, 1658, 4to. An English translation, with remarks, was printed at London in 1653, 4to. This work is divided into four parts; the first contains the principles of human knowledge; the second treats of the laws of nature, the principles of natural things, the properties of bodies, space, motion, &c.; the third contains a particular explication of the system of the world, and more especially of the heavens and celestial bodies; and the fourth treats of the earth. In 1645, Des Cartes applied again to anatomy, though he was somewhat diverted from this study by the problem concerning the quadrature of the circle, which was then agitated, and which he declared impossible to be solved. During the winter of this year he composed a small tract against Gassendi's "Institutes," and another "On the Nature of the Passions." About the same time he had a dispute with Roberval concerning vibrations, and he carried on a correspondence with the princess Elizabeth upon moral philosophy. In the year 1647, he was appealed to as an umpire in a dispute between Christina, queen of Sweden, and M. Chanut, the French resident in that kingdom. The question in debate was this: "When a man carries love or hatred to excess, which of these two irregularities is the worst?" On this occasion he drew up the "Dissertation upon Love," that is printed in the first volume of his letters, which proved highly satisfactory to the queen; though she objected to one passage, which seemed to intimate that the world was not finite. This learned prince, having, by M. Chanut, desired his opinion of the sovereign good, was so much pleased with his answer and with his treatise on the passions, which he sent her, that she expressed a wish to be instructed by him in the principles of his philosophy, and invited him to Sweden. Des Cartes, notwithstanding the apprehended injury that might attend the severity of the climate, accepted the invitation, and arrived at Stockholm in October, 1648. The queen received him with respect, engaged him

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Queen Chriflina early solicited this eminent philosopher to remain in her kingdom, and to affift her in establishing an academy of sciences; and with this view propofed to allow him a revenue of 3500 crowns a year, with an estate which should defend to his heirs and afligns for ever. But Des Cartes had not been more than four months in Sweden, when a cold, which he caught in his early visits to the queen, brought on an inflammation of the lungs, which foon terminated his life, on the 11th of February, 1650, in the 54th year of his age. The queen is faid to have lamented his death with tears. His remains were interred, at the requeft of the French embaffador, in the cemetery for foreigners, and a long historical enulogium infcribed on his tomb. Seventeen years afterwards his bones were carried from Sweden to France, and interred with great pomp in the church of St. Genevieve du Mont, where a magnificent monument, with his build in buflfo-relievo, and an appropritate infcription, is erected to his memory.

Des Cartes, as his various writings amply teftify, poifefled an accurate and penetrating judgment, a fertile invention, and a mind superior to prejudice; qualities which, united with an early acquaintance with ancient learning, and indefatigable industry in the investigation of truth, might ferve to promote no inconfiderable share of fuccefs in the great defign of reforming and improving philosophy. He would have been more fucceful if he had been lefs defirous of applying mathematical principles and reafonings to fubiects which do not admit of them; if he had fett lefs value upon mere conjectures; and if he had been lefs ambitious of the honour of founding a new fect in philosophy. See the next article. We fhall here fubjoin fome additional tesimonials to his character. M. Bullet, in his account of his life, &c, highly commends him for his contempt of wealth and fame, his love of truth, his modesty, diligence of defire, moderation, prudence, and fubmission to the authority of the church. Dr. Barrow, in his "Optica, tells us, that he was undoubtedly a very good and ingenious man, and a real philofopher, and one who f seems to have brought thofe affiduitics to that part of philosophy which relates to matter and motion, which, perhaps, no other had done; that is, a great fkill in mathematics, a mind habituated both by nature and cultum to profound meditation, a judgment exempt from all prejudices and popular errors, and furnished with a con- siderable number of certain and fect experiments, a great deal of lecture, entirely difengaged by his own choice from the reading of useless books, and the avocations of life, with an incomparable acutenefs of wit, and an excellent talent of thinking clearly and distinctly, and regulating his thoughts with the utmost perfection. Dr. Halley (of Wotton's Reflections upon Ancient and Modern Learning), fays, "as to Dioptrics, though a great number of previous experiments, obferves nevertheless, that 'to a vail genius he joined an exquisite skill in geometry, so that he brought upon intelligible principles in an intelligible manner, though he very often failed in one part of his end, namely, a right explication of the phenomena of nature; yet, by marrying geometry and physics together, he put the world in hopes of a malenee expiring in process of time, though the firit productions should prove abortive." Dr. Keil, in the introduction to his "Examination of Bunten's Theory of the Earth," annexing to Wotton's reflections, &c. tells us, that Des Cartes was fo far from applying geometry and obfervations to natural philosophy, that his whole fylem is but one continued blunder on account of his negligence in that point; which he could easily prove by fhowing, that his theory of the vortices, upon which the whole fylem is grounded, is absolutely falf: and that the Isaac Newton has fhown, that the periodical times of all bodies, which fhim in a vortex, must be directly as the fquares of their difiances from the centre of the vortex. But it is evident, from obervations, that the planets, in turning round the fun, obfere quite another law; for the fquares of their periodical times are always as the cubes of their difiances; and therefore, fince they do not obfere that law, which they necessarily muft, if they fhim in a vortex, it is a demonstration that there are no vortices, in which the planets are carried round the fun; with more to the fame purpofe. Mr. Baker, confidering the natural philosophy of Des Cartes, obferves, that, "though it would be very unjust to charge Des Cartes with the denial of a God, who is fupofed by him to have created matter, and to have imprefled the first motion upon it, yet he is blameable, that after the first motion is imprefled, and the wheels fe et going, he leaves his vail machine to the laws of mehanifm, and fuppofes that all things may be thereby produced without any further extraordinary affifiance from the firft impreflor. The fuppofition is impreflor, and, as he fates it, deftructive of itself; for, not to deny him his laws of motion, most of which have evidently fhown to be falf, and confequently fo muft all he that is built upon them, his motion of matter is inconsistent with any motion at all; for, as space and matter are with him the fame, upon this fuppofition there can be no motion in a fpace." Dr. Keil condemns Des Cartes for encouraging the prepuflitious pride of the modern philosophers; who think they understand all the works of nature, and are able to give a good account of them. Mr. Leibnitz, whilst he acknowledges that Des Cartes was a very learned man, and had read more than his followers imagine, and that he was one of those, who has added more to the discoveries of their predeceffors, obferves, that some of whom have entirely in them, are much miftaken in their conduct; and this, he fays, is true, even with regard to geometry itself. He alfo remarks, that Des Cartes endeavoured to correct fome errors with regard to natural philosophy, but that his prepuflitious and contemptuous manner of writing, together with the obfcurity of his fyle, and his confufion, and fevere treatment of others, are very disagreeable. Voltaire, in his "Letters concerning
CARTESIAN PHILosophy.

Concerning the English Nation," (Lett. 14) observes, that nature had favoured Des Cartes with a strong and clear imagination, whence he became a very singular person both in private life, and in his manner of reasoning. This imagination could not conceal itself even in his philosophical writings, which are every where adorned with very brilliant and ingenious metaphors. Nature, says he, had almost made him a poet; and, indeed, he wrote a piece of poetry for the amusement of Charles, Queen of Sweden, which, however, was afterwards enlivened in honour of his memory. He extended, continues he, the limits of geometry as far beyond the place where he found them, as he did Newton after him; and first taught the method of expelling curves by equations. He also applied this geometrical and inventive genius to dodiscrises, which, when treated by him, became a new art; and if he was mistaken in some things, it was because a man who discovers a new tract of land, cannot at once know all the properties of the soil. Those who come after him and make these lands fruitful, are at least obliged to him for the discovery. Voltaire, however, acknowledges, that there are innumerable errors in the first of Des Cartes's works; and then adds, that geometry was a mode by which he himself had in some measure formed, and which would have falsely conducted him through the several paths of philosophy; but that at last he abandoned this guide, and gave entirely into the humour of framing hypotheses; and then philosophy was no more than an ingenious romance, fit only to amuse the ignorant. After other appropriate remarks, he concludes with these observations: "He destroyed all the absurd chimera's with which youth had been intoxicated for 2000 years. He taught his contemporaries how to reason, and enabled them to employ his own weapons against himself. If Des Cartes did not pay in good money, he however did great service in curing down that of a base alloy." Father Rapin, in his "Réflexions de Physique," after observing that Des Cartes's principles of motion, figure, and extension, are almost the very same with those of Democritus and Epicurus, tells us, that father Merfenne mentioned in an assembly of learned men, that Des Cartes, who had gained great reputation by his geometry, was preparing a system of natural philosophy, in which he admitted a vacuum; but the notion was ridiculed by Roberval and some others; upon which Merfenne wrote to him, that a vacuum was not then in fashion at Paris, which induced Des Cartes to change his scheme, in compliance to the natural philosophers, whom he flattered to please, and admit the plenum of Leucippus: "so that," says father Rapin, "the exclusion of a vacuum became one of his principles, merely from political considerations." Rapin produces no authority for this story; and it should be recollected, that he was a very zealous Aristotelian, extremely prejudiced against any new system of philosophy.

Des Cartes, it is said, imagined it possible to prolong life very considerably beyond the common period, and thought he had discovered the method of doing it. In conversation with Sir Kenelm Digby, Des Cartes assured him that, having already considered that matter, he would not venture to promise to render a man immortal; but that he was very sure it was possible to lengthen out his life to the period of the patriarchs. It seems evident to me, says he, in a letter written to M. de Zuylichem from Egmund, in 1636, that he had attacked the age, and that he had guarded against certain errors, which are accustom'd to commit in the course of our diet, we might, without any other invention, attain to an old age, much longer and more happy than now we do. However, twelve years after this declaration was made, our philosopher died. Des Cartes was never married, but had one natural daughter, named Francisc, who died in 3 years of age. Of his works there have been several editions, several of which have been already mentioned.

For an account of the improvements made by Des Cartes in algebra and geometry, see the article Algebra, and Montucla's Hist. Mathæn. sub infra. In reference to the dispute between his friends and those of Harriot, as to the priority of their discoveries, we shall here add, to what occurs under the article Full Circle, an anecdote told by Dr. Pell, and recorded by Dr. Wallis in his "Algebra." Sir Charles Cavendish, then resident at Paris, had a conversation with M. Roberval concerning Des Cartes's geometry, then lately published, to this purpose: "I advance," says Roberval, "that method of Des Cartes, of placing all the terms of the equation on one side, making the whole equal to nothing, and how it occurred to him: the reason why you admire it, says Carls, is, because you are a Frenchman; for if you were an Englishman, you would not admire it. Why so? asked Roberval. Because, replied Sir Charles, we in England know where he had it; namely, from Harriot's Algebra. What book is that? says Roberval; I never saw it. Next time you come to my chamber, said Sir Charles, I will shew it to you; which, some time after, he did; and, upon perusal of it, Roberval exclaimed with admiration, "Hic est! hic est! I have seen it! He had seen it! He had seen it! finding all that in Harriot which he had before admired in Des Cartes, and not doubting that Des Cartes had it from thence. Besides, as Harriot's "Artis Analytice Praxis" was published in 1631, and Des Cartes was in England about this time, and as he follows the manner of Harriot, except in the method of noting the powers, it is highly probable that he was more indebted to the English algebra than his partial advocates are willing to allow. For an account of Des Cartes's philosophy; see the next article. Gen. Dict. Brucker's Hist. of Phil. by Leibnitz, vol. ii. c. 2. § 6. Montucla, Hist. Math. t. ii.

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CARTESIAN Philosophy, or CARTESIANISM, the system of philosophy advanced by Des Cartes, and maintained by his followers, the Cartesians.

The Cartesian philosophy is founded on two great principles, the one metaphysical, the other physical. The metaphysical principle is this, I think, therefore I am. This principle has been attacked and defended, with great spirit, zeal, and partiality on both sides; for though it be true that we are as sure by an inward perception or consciousness, that we exist, as that we think; yet it is true, too, that the conclusion of this reasoning, I am, is drawn from the antecedent I think; since to think supposes to be, or exist; and the mind sees clearly the necessary connection between thinking and being.

In order to acquire this fundamental principle, this first and most certain truth in philosophy, Des Cartes recommends to divest the mind of every kind of prejudice, and for this purpose to begin with doubting of everything. Since the senses err, and dreams deceive, it is first to be doubted, whether sensible objects have a real existence; and we ought also to doubt concerning every mathematical axioms, because we are not sure that we may not have been so formed as to be under a perpetual deception. But whatever else we doubt of, it is impellible we should doubt, whether we ourselves, who are capable of exercising the power of thinking, exist. Of such importance, in the estimation of Des Cartes, is this kind of scepticism, that he advises his readers to consider his reasons for doubting of all things, not once only, but to em-
own existence, we are next to inquire what sort of beings we are, before we admit the existence of any thing external; and in the prosecution of this inquiry, we perceive belonging to our nature "an idea," which has neither extension, figure, local motion, nor any other property which we commonly ascribe to bodies, and of the existence of which we have a prior or more certain knowledge, than of that of any thing corporeal. The mind having thus gained a knowledge of itself, but still doubting the existence of external objects, proceeds in the enlargement of its knowledge, and finds within itself "an idea," concerning the existence of which, as long as it retains its contemplation merely to itself, without offering or denying any thing like them to exist externally, it cannot be deceived. It also finds within itself certain "common notions," and from these frames various demonstrations of the truth of which, as long as its attention is directed to them, it is thoroughly persuaded. But because it does not yet know, whether it may not be so formed, as to be deceived in those things which appear most evident, it perceives it to be impossible to admit any certain science, till it has discovered the author of its being. Revolving within itself its various ideas, it finds one of a being supremely intelligent, powerful, and perfect, in which it discovers an existence, not possible and contingent only, as in its ideas of all other things, but necessary and eternal. Since it finds within itself this idea of a supreme being, which could not be a fiction of its own, it concludes with certainty that it must have proceeded from a really existing deity, and consequently that it represents a true and immutable nature, which cannot possibly not exist, that is God. According to this innate idea of Deity, we find him to be eternal, omnipotent, omnipresent, the fountain of all good and truth, the creator of all things; and as nothing can be an attribute of the divine nature, which implies limit or imperfection, he is, therefore, incorporeal, indivisible, and void of passion, and exercises his understanding and volition, not by continued operations, but by the most simple action. Upon the will of this being, infinitely perfect, and necessarily existing, Des Cartes makes the certainty of self-evident propositions or axioms, as well as of all other necessary truths, to depend. From the knowledge of the caufe thus established, he proceeds to deduce a complete knowledge of his effects by necessary steps; and he rejects all final causes from philosophy; the most perfect kind of science being, in his judgment, that of effects from their causes. From the veracity of the Deity, he infers the reality of material objects, which are represented by our senses as existing without us. The idea of extended matter is presented to the mind; if, therefore, matter did not really exist, God, who presents this idea before the mind, would be a deceiver.

The physical principle of Cartesianism is this, that nothing exists but substances; and these are of two kinds, viz. one which thinks, or mind, and another which is extended, or body. The essence of the former is thought, and that of the latter extension; so that the thinking substance cannot be without some actual thought; nor can any part be detached from the extension of a thing, without taking away so much of its substance. Other attributes ascribed to each of these substances are modes or quantities. The first article is opposed by Mr. Locke, who endeavours to show, that thinking is not essential to the soul, or that its essence does not consist in thought; but that there are various occasions wherein it does not think at all. See dream. The latter is strongly opposed by the Jesuits, &c. as inconsistent with the doctrine of transubstantiation; but is much better confuted by the modern writers, from the principles of the Newtonian philosophy.

The sole essential property of body being extension, and quantity differing from extended substance, only in our conceptions, space, and the corporeal substance contained in it, are in reality the same; for extension in length, breadth, and depth, which constitutes space, also constitutes body. Since extension is universal, Des Cartes maintains there is no vacuum, nor any possibility thereof in nature; but that the world is absolutely full: for mere space is excluded by this principle; because extension being implied in the idea of space, matter is so too. If there were any such thing as a vacuum, says he, it might be measured: the vacuum, therefore, is extended, and of consequence is matter; every thing extended being matter. See Vacuum.

He adds, however, after denying a vacuum, or extension without matter, or properties of matter, that its parts are separable and moveable; though these seem to imply more than mere extension. He defines motion to be the translocation of a body from the neighbourhood of bodies that are in contact with it, and considered as contiguous, to the neighbourhood of other bodies; and thus defines the distinction between absolute or real, and relative or apparent motion; though both equally agree in this definition. He maintains that the same quantity of motion is always preserved in the universe; because God, he says, must be supposed to act in the most constant and immutable manner. And hence he likewise deduces his three laws of motion: according to which God, the first universal cause of all motion, in the beginning communicated motion to matter; viz. that a body must continue in its state, as to rest, motion, figure, &c. till some external influence produce a change, which is his first law of nature; that the direction of motion is naturally rectilinear, or that a body never changes its direction of itself; which is his second law:—and that a body in motion, when it meets with another moving with a greater force, is reflected without losing any part of its first motion; but when it meets with a body moving with less force, it then carries this body along, and loses as much motion as is transferred to it; and this is his third law of nature. He accounts for the hardness of bodies from their parts being quitted with respect to each other; and for fluidity from their being perpetually moved in all directions. These principles, says Des Cartes, are sufficient for explaining all the phenomena of nature; and no others ought to be admitted or even wished for: and yet there is not hardly any one of them, that is not liable to insuperable difficulties. Des Cartes concluded, from the immutability of the deity, that the same quantity of motion is always preserved in the universe; whereas this quantity is continually varying: it is diminished in the composition of motion, and in many cases, in the collision of bodies which have an imperfect elasticity; and it is increased in the resolution of motion, and in some cases, in the collisions of elastic bodies. Moreover, it requires an active principle to account for the hardness of bodies, not as it sufficient for this purpose that the particles be at rest; for this would not hinder their being separated from each other by the least force.

These principles of physics once supposed, Des Cartes explains mechanically, and according to the laws of motion, how the universe might have acquired its present form, and may be for ever preserved; and whence the present appearances of nature do arise. He supposes, that God created matter of an indefinite extension; that he divided this matter into little cubic portions, or malleus full of angles; so as to replenish space without leaving any interstices between them; and that these particles, deriving from the motion impressed upon them an incessant agitation, which broke off their angular parts, became round, and formed what this ingenious
genious and fanciful philosopher, calls the matter of the second element. The angular parts themselves, being ground into the null fubtile particles of all, became the matter of his first element, and forced to fill all the pores of the other. But there being more of this first element than was necessary for that purpose, it became accumulated in the centres of the vortices, of which he imagined the universe to consist, and formed there the bodies of the sun and stars. For, according to this philosopher, the solar system were infinite in number, each fixed star being the centre of one; and he, indeed, is among the first of the moderns, who thus removed the boundaries of the universe; even Copernicus and Kepler themselves, having confined it within, what they supposed, the vault of the firmament. The centre of each vortex being thus occupied by the null active and moveable parts of matter, there must necessarily among them be a more violent agitation than in any other part of the vortex, and this violent agitation of the centre cherubled and supported the movement of the whole. The heavens were filled with the matter of the second element, the medium of light. But the planets and comets composed of a third element greater than the other two, the generation of which our philosopher traces through all its steps. According to him, the matter of the first element must have constantly flowed out through the interstices between the spherical particles of the second element, where the circular motion is greatest, and must have returned continually at the poles of this motion towards the centre of the vortex; where, being apt to cohere together, they at length produced the greater particles of the third element; and when these came to adhere in a considerable quantity, they gave rise to the spots on the surfaces of the sun or stars. Some being crowded out with such spots became planets or comets; and the force of their rotation becoming languid, their vortices were absorbed by some more powerful neighbouring vortex. In this manner the solar system was formed, the vortices of the secondary planets having been absorbed by the vortex of the primary, and all of them by that of the sun. Des Cartes also maintains, that the parts of the solar vortex increase in density, but decrease in celerity, to a certain distance; beyond which he supposes all the particles to be equal in magnitude, but to increase in celerity as they are farther from the sun. In those upper regions of the vortex he places the comets; in the lower parts he ranges the planets; supposing those that are more rare to be nearer the sun, that they may correspond to the density of the vortex, where they are carried round. He accounts for the gravity of terrestrial bodies from the centrifugal force of the other revolving round the earth; which, he imagined, must impel bodies downwards that have not a greater centrifugal force, much in the same manner as a fluid impels a body upwards that is immersed in it, and has a less specific gravity than the fluid. From the same principles he professes to explain the phenomena of the magnet, and to account for every phenomenon in nature.

The system of Des Cartes, notwithstanding its defects and errors, and though in some respects it has more the appearance of a romance than of a just philosophy, was distinguished in an eminent degree by its subtility, ingenuity, and originality; so that it not only engaged the attention of the learned, but long continued, in the midst of all the opposition with which it had to encounter from the professed enemies of innovation, to be zealously defended by many able writers, and to be publicly taught in the schools throughout all Europe. If we trace Cartesianism to its origin, we shall find that some parts of it appear to have been derived from the Grecian philosophy; particularly the notion of innate ideas, and of the action of the soul upon the body, from Plato; the doctrine of a plenum from Aristotle; and the elements of the doctrine of vortices from the atomic school of Democritus and Epicurus; but Des Cartes contrasted, by the vigorous powers of his genius and the fertility of his imagination, to form of these and similar materials a new system of philosophy, which professed to resolve all difficulties, and to comprehend a satisfactory explanation of all the phenomena of nature. His labours, however, would have been more valuable, if he had not sacrificed himself to be led allay into the romantic regions of hypothesis by the false notion, that the nature of things may be better understood by endeavouring to account for appearances from hypothetical principles, than by inferring general principles from an attentive observation of appearances. Accordingly, his followers for hypothesis led him to confound the ideas of attribute and substance, as in his definitions of matter and space; and those of possibility and probability, as in his doctrine of vortices. Even his celebrated argument for the existence of God, which, indeed, had long before his time been advanced by St. Anselm, archbishop of Canterbury, in his book "Contra Inseiptentem," and by St. Thomas Aquinas, and other scholastic writers, confounds the idea of an infinite being with the actual existence of that being, and substitutes a mere conception of the idea of a term in the place of the idea of a being really and substantially existing. Not to add, what is much to be regretted, that, though his whole system is built upon the knowledge of God, and supposes his agency, in establishing the doctrine of a deity, he foresees the clear and satisfactory ground of final causes, and had recourse to a subtle argument, which few can comprehend, and with which fewer still will be fully satisfied.

In the revolution which the system of Des Cartes produced among metaphysicians and philosophers, the superiority of his genius was assisted by the peculiar circumstances of the times; and it required the efforts of such a genius to demolish the structure of Aristotelian philosophy. Aristotle had been, for more than a thousand years, regarded as an oracle; and his authority was the rule of truth. The Peripatetic doctrine were so incorporated with the whole system of scholastic theology, that to differ from Aristotle was to abominate the church. However, the prevailing system was beginning to lose its authority. Des Cartes perceived its defects; and he feized the favourable moment to introduce and establish a new system. Having applied much to the mathematical sciences, and having made considerable improvement in them, (see the preceding article,) he wished to introduce that peripetia and evidence into other branches of philosophy which he found in them. To him we must allow the honour of having been the first who drew a distinct line between the material and intellectual world; which in all the old systems, were so blended together, that it was impossible to say where the one ended and the other began. In that part of philosophy which relates to the mind, Des Cartes laid the foundation, and put us into that track, which all wise men now acknowledge to be the only one in which we can expect success. With regard also to physics, or the philosophy of body, if he had not the merit of leading men into the right track, we must allow him that of bringing them out of a wrong one. By the diffusion of the Cartesian system, materia prima, substantial forms, and occult qualities, with all the jargon of the Aristotelian physis, fell into utter disgrace, and were never mentioned by the followers of the new system, but as a subjeet of ridicule. Aristotle, after a reign of more than 1000 years, was now exposed as an object of derision even to the vulgar, arrayed in the mock majesty of his substantial forms and occult qualities. Queens and
and principles, the most distinguished personages of the age, courted the conversation of Des Cartes, and became adepts in his philosophy. In this number we may reckon Christiana, queen of Sweden, and Elizabeth, daughter of Frederic, King of Bohemia, the mother of our royal family. The latter, though very young when Des Cartes wrote his "Principia," he declares to be the only person whom he knew, who perfectly understood not only all his philosophical writings, but the most abstruse of his mathematical works. The triumph of the Cartesian system over that of Aristotle is one of the most remarkable revolutions in the history of philosophy. When his authority ceased, that reverence for hard words and dark notions, by which men's understandings had been brougth in early years, was turned into distrust, and every thing suspected which was not clearly and distinctly understood. This is the spirit of the Cartesian philosophy; and it is a more important acquisition to mankind than any of its particular tenets; and although after the sober method of philosophizing, introduced by lord Bacon, began to be generally adopted, and the fabrications of romantic theories gave way to the experimental study of nature, the system of Des Cartes, like "the bassefs fabric of an air-vision," had disappared, and has fearlessly "left a wreck behind;" yet for exciting this spirit to zealous, and spreading it so successfully, Des Cartes deserves immortal honour. Besides, by introducing geometry into physics, and accounting for natural pheno-menon from the laws of mechanics, he did infinite service to philosophy; and contributed both by his practice and example, to free it from that venerable ruff, which in a long succession of ages it had contracted; and thus to him, in some measure, is owing the present system of the mechanical, and even of the Newtonian philosophy.

After the above detail, we shall not wonder that the Peripatetics, or Aristotelians, seconded by the influence of the clergy, who apprehended that the cause of religion was aimed at and endangered by the philosophical innovations of Des Cartes, should excite a clamour, and exert their utmost efforts to prevent the overthrow of their old system, and to diminish the growing reputation of the new philosophy. To order the more readily and effectually to execute this invicious purpose, they not only accused Des Cartes of the most dangerous and pernicious errors, but proceeded, in the extravagance of their maliginy, to allege against him a charge of atheism, which those who are acquainted with his revered principles, and with the basis of his system, must perceive to have been altogether unfounded. The Theophils, Rohemans, and Chemists also entered into the conflict against Des Cartes, though they conducted themselves with greater moderation than the Aristotelians. The consequences of this dispute were, however, favourable to the progress of science; for many European philosophers, who were adverse to the disquieting sentiments of Des Cartes, were nevertheless encouraged by his example to pursue their inquiries with greater freedom from the restraints of tradition and personal authority than they had formerly done, and to emancipate themselves from that yoke of servitude under which Aristotle and his followers had so long kept them in subjection. Among the most eminent contemporaries of Des Cartes, who applauded, in general, the efforts he made towards the reformation of philosophy, and the noble resolution with which he broke the shackles of magisterial authority, and who also acknowledged that he had made valuable discoveries in philosophy, there were some who denounced several essential defects in his philosophy, and who considered it in various respects as hypothetical, founded on fancy rather than experience. They actually attacked the fundamental principles upon which his whole system of philosophy was built, such as his ideas of the Deity, of the universe, of matter and spirit, of the laws of motion, and other points that were connected with these. Some of these principles they pronounced to be uncertain; others of a pernicious tendency, and adapted to produce the most dangerous errors; and others again they considered as directly contrary to the language of experience. At the head of these objectors was his own fellow-citizen Gassendi, who had made war before him upon the Aristotelians and Chemists; who, in genius, was his equal; in learning, far his superior; and whose mathematical knowledge was most uncommon and extensive. Gassendi first attacked those mathematical principles, which supported the whole structure of the Cartesian philosophy; he then proceeded to refutations, in the spirit of the Cartesian system, one that refuted the natural philosophy of Epicurus, though much more rational, consistent, and perfect. See Gassendi. The controversy between these philosophers, Gassendi and Des Cartes, produced two leading philosophical sects, denominated the Mathematists and Metaphysists, which fer.

Cartesianism was nearly prohibited by an arrest of the parliament of Paris; and all had been so in effect, if it had not been prevented by a hurleau address presented to the first president. After the Cartesian philosophy had been favourably received, it was vehemently attacked, in the year 1639, by Vost, professor of theology at Utrecht, who regarded it as a system of impiety; and this affection he grounded upon the following principles by which it was introduced: viz. "that the person who affirms after the character of a true philosopher must begin by doubting of all things, even of the existence of a Supreme Being—that the nature or offence of spirit, and even of God himself, confounds in thought—that space has no real existence, is no more than the creature of fancy—and that, consequently, matter is without bounds." Des Cartes defended his principles; but Vost was seconded by the most eminent Belgian divines, and applauded by the greatest part of the Dutch clergy. In 1656, when the principles and tenets of Des Cartes were applied to the illustration of theological truth, an alarm was raised in the Dutch churches and schools of learning, and it was resolved in several of their ecclesiastical assemblies not to permit that "impiety" philosophy, as Cartesianism was called, to make such encroachments upon the domain of theology. The states of Holland approved this resolution, and issued a public edict, forbidding both the professors of philosophy and theology either to explain the writings of Des Cartes to the youth under their care, or to illustrate the doctrines of the gospel by the principles of philosophy. It was further resolved by an assembly of the clergy, held at Delft in the following year, that no candidate for holy orders should be received into the ministry before he made a solemn declaration, that he would neither promote the Cartesian philosophy, nor disfigure the divine simplicity of religion, by loading it with foreign ornaments. Laws of a like tenor were afterwards passed in the United Provinces, and in other countries. But all these measures were inefficacious to stop the progress of Cartesianism, which, at length, obtained a bold and permanent footing in the universities of learning, and was applied, both in the academies and pulpits, and sometimes indeed very preposterously, to explain the truths and precepts of Christianity. See on the subject of this article, M. la Motardin's Account of the State of Newton's Philosophical Discoveries, b. i. c. 4. Brucker's Hist. of Phil. by Enulio, vol. ii. c. ii. § 6. Cudworth's Int. Syll. ch. v. § 1. Reid's Essays on the Intellectual Powers of Man, ch. viii. Smith's Essays on Philo. Subjects, p. 176. Motheim's E. H. vol. v.

CARTHAGE, in Ancient Geography, one of the most powerful
powerful cities of antiquity, was for many ages the capital of Africa Procula, called also the territory of Carthage. See Africa. It was at first called Cadaram, i.e. the cataract, from the name of Cadmus, which was common to the chiefs of the Phoenician colonies. It was also denominated Tharros, which in the Phoenician language signified a horse’s head, found, as tradition reports, by the Tyrians, when they were digging for the foundations of the fortress called Byrsa, and considered as an omen portending the mortal disposition of the inhabitants, and the future greatness of the city. To this circumstance Virgil refers, Aen. i. i. v. 447. 

"Eliudere loco lignum, quad regis Juno
Mundaretur caput aries equi; hic nam facto bello
Egypigum, et faciem vetu per terram gentem.

"The Tyrians landing near this holy ground,
And digging here, a prodigious omen found;
From under earth a courser’s head they drew,
Their growth and future fortune to forebode:
This fated sign their founder’s Juno gave,
Of a foal fruitful, and a people brave." — Dryden.

On account of this event the Carthaginians had frequently, upon the reverences of their coins, either a horse’s head, or the body of a horse dimitted, or a horse entire, with Victory mounted upon him. Others say, that when Dido arrived in this country, a city actually existed called Utica, or the ancient; and that she called her city Carthago-lata, or Cartudades, Ναυτία Ναντία, that is, the new city; and from this appellation the Greeks, interchanging Χ and Σ, deduced Ἀρχαντία, Carthago, and the Romans Cartago. Among the more ancient Romans, however, the name of this city, derived from the Carthaginians themselves, was Catoce, as appears from the Columna Rostrata of Dioclus.

Authors are much divided as regard to the era of the foundation of Carthage. It was built, according to Velcius, 65 years, but according to Trogus and Julian, 72 years, before Rome. Livy seems to place its foundation 20 years higher than tbe; and Solinus exceeds him 27 years. From Menander the Ephesian, cited by Josephus, and the Tyrian Annals, it appears to have preceded the Roman era 150 years. According to Livy and Appian, Carthage flood somewhat above 700 years, and Solinus, adding the odd number of years, reckons the period of its existence 717 years; and as it was destroyed by the confidante of Mentuelus and Mammius, in the year of the Julian period 428, the 66th of the Roman era, and the 146th year before Christ, if we reckon backwards 737 years, we shall arrive at the 883d year B.C., the second year of Athaliah, queen of Judah; and the conciliar, or dedication of the city, says Sir Isaac Newton (Chrom. and Works by Horsey, vol. v. p. 520), will fall upon the 16th year of Pygmalion, the brother of Dido, and king of Tyre. She fled in the 7th year of Pygmalion, i.e. in the year 874 B.C. the 4th year of Josiah king of Judah; but the era of the city began with its conciliar. Josephus (Cont. Ap. l. i. c. 18.) reckons 143 years from the building of Solomon’s temple to the building of Carthage, which has since been extinct and which is not to be distinguished from the flight of Dido in the 7th of Pygmalion. The temple was dedicated in the year 1003 B.C. and thus the 7th of Pygmalion will be the 861st year B.C. and the 16th of Pygmalion will be the 852d year B.C. Solomon surmounted the building of the temple 30 years; and therefore the interval from Solomon’s death to the flight of Dido will be 113 years, from which subtracting 7 years, there will remain 106 years for the interval between Solomon’s death and the beginning of Pygmalion’s reign; and allowing that Solomon died in the 975th year B.C. the 7th of Pygmalion will be the 862d year, B.C. and the 16th of Pygmalion will be the 853d year, B.C. Petavius (Rat. Temp. i. c. 11), after confounding the contradictory opinions of the ancients with great attention, fixes the Carthaginian era with an apparent exactness; for, according to Petavius, Dido began to build Carthage 177 years before the foundation of Rome, i.e. with Vartus, we place this in the 4th year of the 6th Olympiad (753 B.C. or 142 years, if with aehubius Uther, we prefix the account of Fabius Pictor, the most recent of the Roman historians, and a writer of great authority, who maintains it to be near the beginning of the eight, or 128 years. B.C. Blair, in his Tables, has assigned the same of the building of Carthage to the 869th year, B.C. In order to reconcile the discordant accounts that have been given of this era, it has been suggested, that Carthage consisted of different parts, which are supposed to have been built at different times. Cato, or the part, together with the buildings belonging to it, was built first; Megara, which, in respect of Cation, was called the new town, or Carthada, was built about 194 years later, and Byrsa, about 166 years after Megara.

Whatever difference of opinion may have subsisted among the Georgians about the era of Carthage, it is generally agreed that the Phoenicians were its founders. Eufebius (in Chron.) and Procopius (de bell. Vand.) affirm positively, that the Carthaginians who fled from Jethin retired hither; and St. Austin (in Expos. ad Epip. ad Roman.), is of opinion, that the Carthaginians were descended from the Canaanites. Philo of Byrsa, who lived 530 years before Christ, related, (apud Eufeb. in Chron.) that the first traces of Carthage were owing to Zonius and Charchodon, two Tyrants or Phœnicians, 70 years before the destruction of Troy in the year 1181 B.C. according to Eufebius. Appian (in Lycy.) attributes this event to the fame two Phœnicians, 50 years before that period; and from him Scaliger corrects the numbers of Eufebius. Accordingly, Dido was induced to choose this place for her Tyrians in preference to any other, because it had been inhabited for some time by the Phœnicians, who were her countrymen, and from whom she had, therefore, reason to expect a friendly reception. To this Tyrian prince the concurrent voice of antiquity ascribes the first settlement of Carthage. See Juft. l. xxvii. c. 4. 5. 6. App. de bell. Punic. p. i. Strabo, l. xvii. p. 852. Paterc. l. i. c. 6. This prince, called Elina, but better known by the name of Dido, was the grand daughter of the famous Jezbal, called in Scripture Ethbaal, and the great grand-daughter of Ishbal, king of Tyre. She married her near relation Acerbas, otherwise called Sicharbas and Sichaeus, a very rich prince, and her brother was Pygmalion, king of Tyre. When this prince murdered Sichaeus, in order to seize his immense treasures, Dido, in order to elude the avarice of her brother, withdrew secretly with her deceased husband’s possessions; and after having long wandered in quest of a commodious settlement, she, and her Tyrian attendants, landed on the coast of the Mediterranean, in the gulf where Utica stood; fixed her residence at Carthage; and either founded, or most probably, much enlarged this noble city. The wealth of her husband, and the skill of the Tyrians, who accompanied her, and who were at this time the most polished and ingenious people in the world, enabled her to enlarge and beautify the place, if she did not lay the foundation of it; to wall it round, and build a strong citadel in it; to lay the bases of a most flourishing and extensive commerce for which the Tyrian nation was so renowned; and to introduce a form of government, which we are fared to think one of the most perfect that ever was known in the world. Some writers have affirmed, that Dido outwitted the natives, by defying to purchase of them, for her intended...
temed settlement, only so much land as an ox's hide would compass. This modest request was infallibly complied with; upon which the ox cut the hide into the smallest things, and with them compassed a large tract of ground, on which the built a citadel, called Byrsa, from the hide. But this tale is generally exploded by the learned. This prince, it is said, was afterwards courted by Jabin, king of Gethulia, and threatened with a war in case of refusal. Dido having bound herself by an oath not to contract a second marriage, and being incapable of violating her engagement to Sichæus, defined time for deliberation, and for appeasing the name of her first husband by sacrifice. Having therefore ordered a pile to be raised, she ascended it; and drawing out a dagger which she had concealed under her robe, stabbed herself with it. This story is related with some different particulars by Justin, l. xviii. c. 6.

Virgil has much altered this history, by supposing that Aincas, his hero, was contemporary with Dido, though there was an interval of nearly three centuries between the one and the other; the area of the building of Carthage being fixed 300 years lower than the destruction of Troy. However, in the plan of his story he has displayed great judgment; for as he wrote for the Romans he has contrived to interest them the more, by introducing the implacable hatred which subsisted between Carthage and Rome, and ingeniously deducing the origin of it from the very remote foundation of these two rival cities.

Carthage was situated at the bottom of a gulf, upon a peninsula 560 fadia, or 45 miles in circumference; the isthmus joining this peninsula to the continent of Africa being 25 fadia, or three miles and a half in breadth. Dr. Shaw, (Travels, p. 82.) concludes from an estimate made on the spot, that the peninsula is about 50 miles round, and that the city may have taken up nearly half that space. On the west side, a long tract of land, half a stadium broad, projected from it, which running into the sea separated it from a lake, or morass, and was strongly fortified on all sides by rocks, and a single wall. In the middle of the city stood the fortress, or citadel, erected by Dido, called Byrsa, which is a Greek corruption of the Punic, or Phænician name Bœrsa, Bûsa, or Bûsa, denoting a fortress, or citadel; and this etymology excludes the fable of the ox's hide. Byrsa, according to Servius, (in Virgil,) was 22 fadia, or near three English miles in circumference; though Diodorus maintains, that it did not much exceed 2000 fadia, or not quite two miles. It contained a rich, beautiful, and spacious temple sacred to Æsculapius, seated on a very high hill, which was ascended by 60 steps. Acrabal's wife set fire to it, and entirely consumed it, together with herself, her children, and 900 Roman defectors, who had fortified themselves in this place in order to avoid falling into the hands of Scipio. On the south side, towards the continent, where Byrsa stood, the city was surrounded by a triple wall 30 cubits high, exclusive of the parapets and towers, with which it was flanked at equal distances, each interval being 480 feet. Each tower had its foundation sunk 30 feet deep, and was four stories high; though the wall was but two: they were arched, and in the lower part, corresponding in depth with the foundation above-mentioned, were slats, large enough to hold 300 elephants, with their fodder; over these were flaries for 4000 horses, and lofts for their food. There was likewise room enough to lodge 20,000 foot and 4000 horse. Here were two harbours, dipsoped in such a manner as to communicate with each other, and having a common entrance, 70 feet broad, secured with chains. The first was appropriated to the merchants, and included a great number of places of refreshment and all kinds of accommodation for the leaven.

The second, or inner port, was, as well as the islet, called Cohen, in the middle of it, lined with large keys, in which were distinct receptacles for securing and sheltering from the weather 220 vessels, and it was defended chiefly for ships of war. Strabo calls the small islet Cohen; but Appian applies the term likewise to the port, or harbour itself. So active were the Carthaginians, that before Scipio had blocked up the old port of Cohen, they in a short time built a new haven, the traces of which are still to be seen. See Cohen. Near the Cohen was a temple of Apollo, in which was a statue of that deity of massive gold; and the inside of the temple was covered with plates of the same metal, weighing 1000 talents. Over the receptacles just mentioned were magazines, or three-houses, containing all necessaries for the arming and equipping of fleets. The entrance into each of these receptacles was adorned with two marble pillars of the Ionic order; so that both the harbour and the islet represented on each side two magnificent galleries. The admirals palace was so situated on the island, just opposite to the mouth of the harbour, that he could see whatever was doing at sea, although no one there could perceive what was transacting in the inner part of the harbour; nor had the merchants, when they entered the port, any prospect of the men of war, being separated from them by a double wall, and each port having its separate gate that led into the city, without passing through the other. The Byrsa was considered as the interior part of Carthage, and was surrounded by the Megara, or Megaria, that is, the houses or towns, for so the word signifies in the Phænicians tongue, or its exterior part; and thus taken together, they formed a kind of double town.

As to the extent of the city, Livy informs us, that it was 23 miles in circumference; and Phiny (l. c. a.) intimates, that Carthage, when poissified by the Phænicians, was much larger than when it became a Roman colony; and Suidas affirms, that it was the greatest and most powerful city in the world. The number of inhabitants contained in this city amounted, at the beginning of the third Punic war, to 700,000. The forces which they were able to bring into the field, and the power which they were capable of exerting at sea, were very formidable. Hamilcar, in his expedition against Gelon, the tyrant of Syracuse, commanded an army consisting of 300,000 men, and the seamen, who had served with the land forces, was composed of more than 2000 ships of war, and above 2000 transports. Their riches were likewise immense; for at the final destruction of the town, even after it had been plundered, and supposed to be entirely exhausted and consumed, Scipio carried away nearly a million and a half flering. The dominion of Carthage was not long confined to Africa. Strabo observes (Geog. lib. xvi.) that the Carthaginians poissified 300 cities in Africa, before the beginning of the third Punic war; nor is this incredible, if we consider, that the dominions of this state in Europe, before that war extended from the western confines of Cyrenæa to the pillars of Hercules, or the straits of Gibraltar, a tract of land near 1500 miles in length. The inhabitants of its ambitious city extended their conquests into Europe, by invading Sardinia, feizing a great part of Sicily, and the islands W. of it, and reducing almost all Spain, even as far as the Pyrenées, and having sent powerful colonies everywhere, they enjoyed the empire of the sea for more than 600 years, and formed a State which was able to dispute pre-emience with the greatest empires of the world by its wealth, their commerce, their numerous armies, their formidable fleets, and, above all, by the courage and talents of their officers.

Carthage, as Dr. Shaw informs us, (Travels, p. 81.) was built upon three hills, somewhat inferior in elevation to the
those upon which Rome was erected. This famous city, after undergoing a variety of revolutions, was at length destroyed by Syrius Aemilius, under the confulure of Lentulus and Mummius, in the 146th year B.C. The Romans, after having completely destroyed it, ordered that it should never bei inhabited, announcing dreadful imprecautions against those, who, contrary to their prohibition, should attempt to rebuild any part of it, especially Bytha and Megara. About 34 or 35 years after this event, C. Gracchus, tribune of the people, in order to ingratiate himself with them, undertook to rebuild it, and with that view conducted thither a colony of 6000 Roman citizens; and this was the first Roman colony that was ever sent out of Italy. Plutarch intimates, that Grecchus executed his design, which was done in a very imperfect manner; but it is more probable that the work was entirely discontinued, however vigorously begun, in compliance with the orders of the senate. Julius Cæsar, as Appian informs us, conceived a design, in consequence of a nightly dream or vision, of rebuilding Carthage. But his untimely death prevented the completion of his purpose. However, Appian says, that his adopted son, Augustus Cæsar, built a city at a small distance from the spot on which ancient Carthage flourished, and called it by the same name, thus avoiding the ill effects of those imprecautions, which had been pronounced at the time of its destruction. Thither, it is said, he sent a colony of 3000 men, who were soon joined by considerable numbers from the neighbouring towns. Strabo, on the other hand, intimates, that both Carthage and Corinth were rebuilt at the same time by Julius Cæsar; and he affirms, that Carthage in his time, that is in the reign of Tiberius, was equal, if not superior, to the largest city in Africa. Plutarch confirms the testimony of Strabo. Pliny also mentions it as a considerable colony in his days. Carthage was elevated the second city in the Roman dominions, and considered as the capital of Africa for several centuries after the commencement of the Christian era. Its bishops, who were subordinate to the bishop of Rome, and not to the patriarchs of Alexandria, occupied a distinguished rank in the western church. Maximus laid it in ashes about the sixth or seventh year of Conflantine's reign, A.D. 311 or 312; and Genric, king of the Vandals, took it A.D. 439. At this time Carthage contained the manufactures, the arms, and the treasuries of the six provinces. Schools and gymnasia were instituted for the education of the African youth; and the liberal arts and manners, grammar, rhetoric, and philosophy, were publicly taught in the Greek and Latin languages. The buildings of the city were uniform and magnificent; a shady grove was planted in the midst of it; the new port, a secure and capacious harbour, subdued the commercial industry of citizens and strangers; and the splendid games of the circus and theatre were exhibited almost in the presence of the Barbarians. The reputation of the Carthaginians was not equal to that of their country, and the reproach of Punic faith fell adhered to their humble and faithftil character. The habits of trade, and the abuse of luxury, had corrupted their manners; but their impious contempt of monks, and the shameless practice of unnatural lusts, are the two abominations which are particularly reprobated by Salvin, the preacher of that age. The king of the Vandals, however, severely reformed the vices of a voluptuous people; and the ancient, noble, ingenious freedom of Carthage was reduced by Genric into a state of ignominious servitude. After he had permitted his licentious troops to satiate their rage and avarice, he instituted a more regular system of rapine and oppression. An edict was promulgated, which enjoined all perfon, without fraud or delay, to deliver their gold, silver, jewels, and valuable furniture or apparel, to the royal officers; and the attempt to sequestrate any part of their property was in extremity punished with death and torture, as an act of treason against the state. The lands of the proconsular province, which formed the immediate district of Carthage, were accurately measured, and divided among the Barbarians; and the conqueror reserved, for his peculiar domain, the fertile territory of Byzantium, and the adjacent parts of Numidia and Gotulia. Belisarius retook it in 533 and annexed it again to the Roman empire. In this revolution the trade of Carthage was not interrupted; the floops continued open and busy; and the soldiers, after sufficient guards had been posted, modestly departed to the houfes, which were allotted for their reception. Belisarius fixed his residence in the palace; seated himself on the throne of Trenchic; accepted and distributed the Barbaric spoil; granted their lives to the suppliant Vandals; and laboured to repair the damage which had been sustained by the suburbs in the preceding night. At supper he entertained his principal officers with the form and magnificence of a royal banquet. He restored with incredible dispatch the walls and ditches of the city, and re-established the strength of an impregnable fortress. At length the Saracens, under Mohammed's successors, towards the close of the seventh century, A.D. 698, so completely destroyed this city, that few traces of it are left. All the remains, says Dr. Shaw, of this once famous city are the area of a spacious room upon one of the hills on which it stood, commanding the south-east there, with several smaller ones at a little distance from it; the common fewers, which time hath not in the least injured or impaired; and the cisterns, which have shared only in a small degree the general ruins of the city. The harbour, indeed, is now filled up, and by the north-west winds, with the river Megeda, the ancient Bagrada, moved almost as far distant from the sea as Africa; though it is still called "El Merfa," or the Port, lying to the north and north-west of the city, and forms, with the lake of Tunis, the peninsula on which Carthage flourished. Livy tells us, that Carthage was only 12 miles from Tunis, and this is the distance that still subsists between that city and a fragment of the western wall of Carthage. Polybius indeed makes the distance of Tunis and Carthage 15 miles. The spot on which it stood is, according to the latest observations, about N. lat. 36° 52'. E. long. 10° 40'. See Carthaginians.

CARTHAGENA, in Geography, New Carthage, a sea-port town of Spain, in the province of Murcia; seated on the declivity of a hill, and separated from the harbour by an intermediate plain. The city is protected from the south and from the west by high mountains and barren rocks; but to the north and east it is open, and communicates with an extensive valley, which is divided from the plains of Penilla by a ridge of hills, whilst to the north, another chain of mountains separates it from the vale of Murcia. On the summit of the hill, commanding the city, is a castle now decaying; but, on the adjacent heights, are raised considerable works, to defend the harbour, with the arsenal and dock-yard. The harbour is the best in Spain, well sheltered from winds, and well defended. The arsenal is large, and is amply furnished with naval stores; a slip of the line, as it is said, may be got ready for sea in three days. The number of inhabitants is reckoned to be 60,000, who are distributed in 15,000 families. The streets are wide, and the houses commodious. They have generally flat roofs, which afford, in this climate, an agreeable

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able and cool retreat, where, after sun-fet, the inhabitants assemble to enjoy the refreshing breeze; the new parade, extending from and well at the head of the harbour, and looking through its entrance into the Mediterranean, is built on a regular plan, and as a high schillicous rock has been cut away to make room for this long range of habitations, excellent vaults are excavated behind each house, for the service of the merchants. At the end of this stands the royal hospitall, defined to receive the sick from the dock-yard and the army, with the "predisarios," or criminals condemned to the galleys, and in Spain reduced to the lowest state of servitude. The cathedral, which is a wretched pile, is now degraded, and the bishop's seat being removed to Murcia, it is become a parish church. Of nine convents, eight are occupied by the men. In the midst of the dock-yard is a spacious basin, and in this the ships of war are moored, each in front of the magazine defined to receive her rigging and her stores. The docks are kept dry by fire-engines, of which three are almost constantly at work. They have here 2000 criminals, chiefly smugglers, who, being condemned to work in chains, are called "predisarios." They are employed in the most servile labour, for 5 or 7 years; and at the expiration of their terms, they are turned loose upon the public, fitted only to pursue their original occupations. These 2000 slaves require a constant guard of 500 soldiers; and independently of this expense, they cost each to government, five reals a day for their maintenance, whilst their work cannot be estimated at one-tenth of what they eat. In this dock-yard the mults and timber are floated in water, without any apprehension of injury from the worm; because, as they never open their sluices till the water is become putrid, the rapid evaporation leaves a strong brine, in which it is impossible for the worm to live.

The fisheries of this sea-port are considerable; and is divided into two branches, independent of each other; that within the port being the property of a fishing company, consisting of 18 associates, establisht here by charter, whilfe, in the open sea, all enrolled mariners are at liberty to fish. Within the port they take chiefly the tunny and the melvas; but the former is the most profitable. Half the quantity of fish that is taken in the harbour, must be sold for the benefit of the poor at a stipulated price; and the king takes one-half of all their profits, amounting to about 1000l. a year, as a compensation for his claim of one-quarter of their fish. In the open sea the fishermen are free from oppression and have peculiar privileges.

At Carthagena they manufactory a large quantity of the "efpanto" ropes and cables, some of which are pun with hemp, and others platted. These cables are excellent, as they float on the surface of the water, and are not therefore liable to be cut by the rocks on a foul coart. The efpanto ruff makes good mats for houses, "alparrages" for pavements, and has lately been spun into fine thread for the purpose of making cloth. This ruff, it is said, is peculiar and natural production of all the high and uncultivated mountains in the south, and affords in the dry and elevated regions, where neitherto hemp nor flax will grow, materials proper for clothing, and for the employment of industry. The most important production of this country, and the most valuable article of commerce is barilla, used for making soap, for bleaching, and for glass. The country producing it is about sixty leagues in length, and eight in breadth, on the borders of the Mediterranean. The quantity exported annually from Spain is about 150,000 quintals, paying a duty of 17 reals per quintal. The chief imports are bale goods and balassas; the later directly from Newfoundland; and of the former muffins and cottons are prohibited, though they are secretly introduced in great quantities. The soil of the adjacent country is loamy, composed of calcearous matter, sand, and clay, from the disolution of the neighbouring mountains, which consist of schillicous rock covered with limestone. In some places is found the fuscineous grit or sand-stone, with flinty or smooth gravel and sea-shells; and at no great distance from the city is a mountain, from which they obtain the gyptum used for plaster. The whole country abounds with salt-pan. Oxen are used for draught; but in tillage they employ mules and asses. Their course of husbandry is wheat, barley, and fallow. They sow their wheat in November, and in July reap from 20 to 100 for one, according to the wetness of the season. They grind all their corn by wind-mills, 30 of which may be counted near the city; and water for common use is scarce and dear. The trees most common in the adjoining valley are elms, poplars, olives, figs, pomegranates, mulberries, apricots, palms, palmtos, and the ginjolero; the last of which bears a small fruit resembling, in size and form, the olive, with a smaller kernel, and remarkably sweet. The palmtos is the chameros. bundis. The most endemical diseases at Carthagena are intermittent and putrid fevers, which arise from the proximity of an extensive swamp, containing many hundred acres. The municipal government of Carthagena is vested in a military governor, with his alcaldes mayor; 30 regidores, whose office passeth by inheritance, if not previously sold; and two syndics chosen by the people as their peculiar guardians. The governor is the supreme and independent judge for the army, and for strangers settled in the country, while his alcaldes presides in the tribunal for the citizens. In consequence of the vicious formation of the government and the mal-administration of the laws, murder and affractions are frequent in Carthagena, and the most atrocious villains escape punishment. Want of fidelity to matrimonial engagements is equally prevalent at Carthagena, as in the other provinces of Spain. N. lat. 37° 37'. W. long. 10° 8' 30". Townsend's Journey through Spain, vol. iii.

This city was founded in the year of Rome 525, (B. C. 229.) by Afrodal, the Carthaginian general, in order to secure the subjection of the country. It was taken by Scipio Africanus in the year of Rome 512 (B. C. 212.), after the defeat of Hannibal under the walls of Carthage in Africa. It became a Roman colony in the time of Cæsar, who establisht a colony in it after the battle of Munda, and was one of those denominated "conventus;" its jurisdiction extending over 65 towns. After having been destroyed by the Goths, it was rebuilt by Philip II. Diamonds, rubies, amethysts, and other precious stones were formerly found in its vicinity, so that it was reckoned the Indies of the Romans; and it was famous for its silver mines. Strabo (i. iii. p. 148.) mentions a mine near this city, which yielded daily 25,000 drachms of silver, or about 300,000l. a year.

Carthagena, a province or government of South America, in the country of Terra Firma, the jurisdiction of which reaches easterly to the great river of de la Magdalena, and along this river southward, till, windings away, it borders on the province of Antioquia; from thence it stretches westward to the river of Darien; and from thence northward to the ocean, along the coasts between the mouths of these two rivers. The extent of this government from east to west is generally computed at 53 leagues; and from south to north 85. In this space, besides mountains and forests, are several fruitful valleys, called by the natives Savannahs; as those of Zamba, Zenu, Tolub, Mompox, Baranca, and others; and in them many settlements,
Large and small, of Europeans, Spanish creoles, and Indians. According to an existing tradition this country formerly abounded in gold, but the old mines are now either neglected, or exhausted. But the riches of the country were principally owing to the trade which it carried on with Choco and Darien; from whence were brought, in exchange for this metal, the several manufactures and works of art which were needed. Gold was so plentiful, that it was the common ornament of the Indians, both men and women. The country, more especially about the capital, is so luxuriant, that the trees and plants which it spontaneously produces frequently present a rich and perpetual verdure; and the interwoven branches of the trees form a shelter impregnable both to heat and light. The trees are large and lofty, very various, and altogether different from those of Europe. The principal, with regard to size, are the cedar or acajon, of which they make their canoes and champanees for fishing, the cedar both white and reddish, the maria, and the ballam tree, which two last, besides the utility of their timber, dill the admirable balsams called maria oil and ballam of Tolu, so called from a village, where it is found most excellent and most abundant. Besides these trees, there are also the tamarind, the madlar, the fatpole, the papay, the guayabo, the caffia, the palm, the manarico, and several others, most of which yield a wholesome and palatable fruit, as well as a durable and variegated wood. In the woods about Carthagena is found a great quantity of bejesco, of different magnate, figure, and colour; one species of which is particularly noticed on account of its fruit, called "habilla de Carthagena," or the bean of Carthagena, which is considered as one of the most effectual antidotes which that country affords against the bites of vipers and serpents. See Hippocrates. This country also abounds with various animals, both tame and wild. The only tame eatable animals are the cow and the hog, which are very plentiful. Wild geese and other poultry are good and very abundant. There are also different kinds of game, as deer, rabbits, and wild boars, called fijones; but these are eaten only by the country negroes and Indians, except the rabbits, which find a good market in the city. The wild beasts are tigers, leopards, foxes, armadillos, lizards, and monkeys, the wildcat and the most common of which are the micos. The birds are innumerable in number, and their various plumage is exquisitely beautiful and brilliant. The most fin gular are the guacamayo, beautiful beyond expression in plumage, but no less disagreeable for its croaking noise, the tucan, or preacher, and the gallinazos, which latter are of great service in cleaning the city of all dirt and ordure, by devouring dead animals, &c. Bats are very common, and they are so numerous at Carthagena, that when they begin to fly, they may be said to cover the streets like clouds. Among the insects and reptiles, the principal are the snakes, the centipedes, the scorpions, and spiders. The constant moisture and heat of this climate will not allow the cultivation of wheat, barley, and other grains of that kind; but maize and rice are produced in great abundance. Of the maize they make a kind of bread, called bollo, which is generally used; and they also use it in feeding hogs and fattening poultry. The cafava bread, made from the roots of yuca, names, and monitos, is very common among the negroes. Plantations of sugar-canes are so general, as to reduce the price of honey; and part of the juice is converted into spirit. Cotton-trees are also in part spontaneously produced, and others, which are the best, are planted and cultivated. The cacao trees of Carthagena excel those of the Caracas and neighbouring districts both in the size and goodness of the fruit. Besides melons, grapes, oranges, dates, and fruits which belong to other countries, Carthagena has some more appropriate to itself, such as the pineapple, the plantain, the banana, the papayas, &c. The chief town of this country is "Carthagena." 

Carthagena, a city and sea-port of South America, and metropolis of the province above described. It is situated on a peninsula, or sand island, which is joined to the continent by two artificial necks of land, the breadth of which is not above 70 yards wide. The fortifications are regular and strong, and constructed after the modern manner. At a small distance from the suburb, called Zecchimani, founded on an island, and connected with the city by a wooden bridge, is a hill, on which is constructed a fort called St. Lazaro, that commands both the city and suburb. The height of the hill is between 25 and 21 toises, and it is joined to several higher hills, which run off in an eastern direction. Thence terminate another hill of the height of 84 toises, on the top of which is a convent of bare-footed Augustines. The city and suburbs are well laid out; the streets are straight, broad, uniform, and well paved. The houses are mostly built of stone; they consist chiefly of only one story above the ground-floor; and the apartments are well contrived. All the houses have balconies of wood, which is more durable in this climate than iron. Carthagena has several churches and convents; and, including its suburbs, it is equal to a city of the third rank in Europe. It is well peopled: the number of its inhabitants, most of whom are descended from the Indian tribes, being estimated at 25,000. The governor resides in the city, and in civil affairs, an appeal lies to the audience of Sta. Fé; and when in 1730 a vice-roy of Sta. Fé was created under the title of vice-roy of New Granada, the government of Carthagena became also subject to him in military affairs. Carthagena has also a bishop, whose spiritual jurisdiction is of the same extent as the military and civil government. The ecclesiastical chapter is composed of the bishop and prebends. There is also a court of inquisition, whose power extends to the three provinces of Ila Española, where it was first settled, Terra Firma, and Santa Fé. Besides these tribunals, the police and administration of the city are conducted by a secular magistracy, consisting of regidores, from whole number are annually chosen two alcaldes. There is also an office of revenue, under an accountant and treasurer, where all taxes and royal revenues are received, and whence the proper issues are directed. A person of the law, under the title of "auditor de la gente de Guerra," determines processes. The bay, which we shall more particularly describe in the sequel of this article, and the country before called "Calamaí," were discovered by Roderigo de Balbís; and in 1504, Juan de la Cofa, and Christopher Guerra began the war against the Indian inhabitants, who, being a martial people, and joined by their women in the fatigues and dangers of war, resisted them with a valour and obstinacy which they did not expect. Their common arms were arrows, which they poisoned with the juice of certain herbs, so that the slightest wounds were fatal. They were succeeded by Alonso de Ojeda, attended by Juan de la Cofa, as his chief pilot, and Amerigo Velasquez, a celebrated geographer of those times; but they met with similar resistance, and made little impression. Nor was Gregorio Hernandez de Oviedo more fortunate. At length, the conquest of the Indians was accomplished by don Pedro de Heredia, who, after gaining several victories over them, subjected this part of America to the crown of Spain in 1533. The advantageous situation of Carthagena, the extent and security of its bay, and the great share it acquired of the commerce of that southern continent, soon caused it to be erected into a bi-...
Carthagena, to which the importance and prosperity of this city has been chiefly owing, is one of the belts, not only on this coast, but also in all the known parts of this country. It extends 2½ leagues from north to south, has a sufficient depth of water and good anchorage, and is so smooth that the ships are no more agitated than on a river, though the numerous shallows at the entrance render it necessary to secure a good pilot. The entrance into the bay is through the narrow irrigation of Bocca Chica, or Little mouth, which, since the invasion of the English, has been shut up, and a more commodious one opened and fortified. Towards Bocca Chica, and 2½ leagues distant seaward, there is a shoal of gravel and coarse sand, having in many parts of it not more than a foot and a half of water. This bay abounds with great variety of fish, such as the flad, &c. The turtles are large and well tainted. But it is very much infested with sharks, which are very dangerous to feamen both in the water, and even in their boats.

The inhabitants of Carthagena and its adjacent territory may be distributed into different castes, or tribes, who claim their origin from a coalition of whites, negroes, and Indians. The whites may be divided into two classes, viz. the Europeans and Creoles, or whites born in the country. The former are commonly called "Cipontones," most of whom, when they have acquired a competent fortune, return to Spain, or remove into inland provinces in order to increase it. Those who are settled at Carthagena carry on the whole trade of the place, and live in opulence; whilst the other inhabitants are indigent, and obliged to recur to hard and mean labour for a subsistence. The families of the white Creoles compose the landed interest; and many of them have large estates. Others, however, are in mean circumstances. Among the other tribes, which are derived from an intermarriage of the whites with the negroes, the first are the "Mulattos;" next to these are the "Tercerones," produced from a white and a Mulatto; after these follow the "Quinterones," proceeding from a white and a Terceron; and the last are the "Quinterones," who owe their origin to a white and Quiteron. The children of a white and Quiteron are called Spaniards, and consider themselves as totally exempt from all taint of the negro race. Between the several tribes, or castes above enumerated, there are other intermediate classes, formed of an intermixture of the former. The several castes from the Mulattos affect the Spanish dress, but wear very light clothes, on account of the heat of the climate; and they compose the mechanics of the city. The clafs of negroes consists of the free and the slaves; and these are again subdivided into Creoles and Bozareos, some of whom are employed in the cultivation of the lands belonging to the city. On account of the extreme heat, the only covering both of the males and females is a small piece of cotton stuff about their waist. The dress of the whites, both men and women, differs very little from that worn in Spain. The whole exccrile of the females in the house consists in fitting in their hammocks, made of twilled cotton, and commonly knot in the form of a net, and swinging themselves for air. Thus they pass the greater part of the day; and men, as well as women, often sleep in these hammocks. Of both sexes it is remarked, that they possess a considerable share of wit and constrution, and are generally adapted to excel in all kinds of mechanical arts. But their females seem to attain an early maturity, and they retain them in a great degree of vigour to an advanced age. The females of every ccl are distinguished by a mild and amiable disposition, and by the promptitude with which they relieve the indigent and destitute. The principal cultums, in a great degree prevalent to this place, are the use of brandy, chocolate,
CARThAGINIANs.

chocolate, honey, sweetmeats, and smoking of tobacco: and the latter practice is common among persons of all ranks and of both sexes. One of the most favourite amusements of the natives is a ball, or "tandango," which, among the populace, consists principally in drinking brandy and wine, interspersed with indecent and scandalous motions and gestures. Their burials are conducted with great pomp and ostentation; and their lamentations over the dead are attended with the most frantic gestures and the most clamorous vociferations. The mourning is continued in the house of the deceased for nine days after the corpse has been laid in the grave.

The climate of Carthage is excessively hot; the degrees of heat being continually the same as that of the hottest day at Paris. The nature of this climate is chiefly manifested from the month of May to the end of November, the season here called winter; during which time, there is almost a constant succession of thunder, rain, and tempests; and the rain descends in such quantities, that the streets appear like rivers, and the country like an ocean. This is the only opportunity which the inhabitants have for filling their cisterns with fresh water; the water of their wells being thick and brackish. From the middle of December to the end of April the rains cease, and the weather is agreeable; the heat being somewhat abated by the N.E. winds, which then set in. This season they call summer; besides which they have another summer of short continuance about the festival of St. John. The invariable continuance of great heats occasioned such profuse perpiration that the complexion of the inhabitants appears wan and livid, and all their motions are sluggish. Yet upon the whole, they enjoy a good state of health, and commonly live even to 80 years and upwards.

The singularity of the climate occasions disorders of a peculiar kind: some of which attack the Europeans upon their first landing; and the others are common both to Creoles and Chapetones. Tho' of the first kind are rapid in their progress, and terminate fatally when they bring on the black vomit. The inhabitants of Carthage and its territory are very subject to the leprosy, in order to stop the contagion of which they have, without the city, a hospital called "San Lazaro," from the hill on which it stands, and in which persons of both sexes, labouring under this distemper, are confined. Another very singular distemper is the cobrilla, or little snake, which is a kind of tumour, which most commonly affects the arm, thigh, or leg; and which they cure by first applying a suppurgative plaiter, and fermenting the whole tumour with oil, and then softening a thread of silk to a kind of white fibre, that diffuses itself, called the cobrilla's head, and winding the other end of it about a card, rolled up like a cylinder: they repeat the fermentation with oil, and the following day continue to wind about the cylindrical card the part of the small fibre, which appears in sight, and thus proceed till the whole is extracted, and the patient cured. N. lat. 10° 26' 33''. W. long. 75° 36' 45''. Juan and d'Ulloa's Voyage to South America, by Adams, vol. i.

CARThAGINIANs, in Ancient History, are supposed to have derived their origin from the Canaanites. See CANAAn and CANAANITeS. They were called by the Greeks, sometimes Libyans, on account of the country they oppress'd; and sometimes Phoenicians, on account of the country from which they were originally defenced. The Romans called them Punic, or Phoenicians, for the same reason; and every thing belonging to them, or their city, Punic, or Phoenic, is Phoenician, or belonging to the Phoenicians. Between the Phoenicians and Carthaginians there always subsisted the strictest union. To this purpose Herodotus informs us (lib. iii.) that when Cambyses had determined to make war upon the latter, the Phoenician, who formed the chief strength of his fleet, positively declined to leave him against their country; and on this account he was obliged to lay aside his design. The Carthaginians, on their part, were never forgetful of the country from which they derived their origin. Accordingly, we learn from Polybius and Quintus Curtius, that they regularly sent every year to Tyre a ship freighted with presents, as a quit rent or acknowledgment paid to their ancient country; and its tutelary gods had an annual sacrifice offered to them by the Carthaginians, who considered them as their protectors. They never failed to send thither the fruits of their revenues, and also the tythes of the spoils taken from their enemies, as offerings to Hercules, one of the principal gods of Tyre and Carthage. The Tyrians, on the other hand, when they wished to consecrate their wives and children from Alexander, who was besieging their city, sent them to Carthage, where they were kindly received and hospitably entertained.

The language of the Carthaginians must at first have been the Phoenician; and this was the same with that of the Canaanites or Hebrews, that is, the Hebrew, or at least a language wholly derived from it. In process of time, however, considering their disunion from Phoenicia, their mother-country, and their intercourse with other nations, their original tongue would be subject to some variation; and yet, notwithstanding these variations, it ever continued to be the same in substance with the Hebrew or Phoenician. In the latter ages the Punic tongue acquired a tincture of the Chaldee and Syriac. As the island of Malta was, for a considerable time, subject to the Carthaginians, the Punic tongue must have long remained in it; and it appears, that about the middle of the 16th century, there were some pillars in the island, which had Punic inscriptions upon them, and so late as that period the Punic tongue was spoken in Malta. The Punic letters, as well as language, must certainly at first have been the Phoenician; and though time produced a change in them, yet they always retained a great resemblance of their original, as the curious inspector may discern in the characters that are found upon the most elegant Phoenician and Punic coins.

The first government settled at Carthage was probably monarchical; for it expired either with Dido, or during her life, and was changed into a republic. Arriostes says, that it was partly aristocratical, and partly political, that is, democratic. According to Polybius, it was composed of monarchy, aristocracy, and democracy. But Horeiates represents the civil government as oligarchical, and the military as monarchical. Arriostes, who intimates, that the Creto, Lacedemonian, and Carthaginian republics were the most perfect of any in the world, gives the preference, in several respects, to the Carthaginian. Of its excellent constitution it has been alleged, as a striking evidence, that notwithstanding the great authority vested in the people at Carthage, no iniquity occurred, from the foundation of the city to his time, of any popular commotions sufficient to disturb the public tranquility, nor of any tyrant, who had been able, at the expense of liberty, to introduce oppression. Hence, it has been inferred, that the three principal powers, of which the constitution of Carthage was composed, were of such a nature as to counterpoise one another, and by their mutual harmony, to preserve the public tranquility and promote the public happiness. These were the suffetes, the senate, and the people. The suffetes, lophetim, signifying, with the Hebrews and Phoenicians, judges, were two in number, of equal dignity and power, and the chief magistrates of Carthage. They corresponded to the two kings of Lacedemon, as well as to the Roman consuls; and hence they are sometimes called kings and consuls. They were annually
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200 years after the first establishment of the tribunal of 100. The principal, if not the only, civil officers, established at Carthage, besides the suffetes, were the praetor, who had great influence in passing and repealing laws, and to whom was committed the charge of the public revenues; the quaesor, who belonged to the bench of judges, who collected and managed the public money under the quaesor; and the censores, whose business was to inspect the manners of the citizens.

The religion of the Carthaginians, as they were defended from the Tyrians, agreed at first in all points with that of the Phoenicians. But by their intercourse with the Greeks, they were led to adopt several new deities before unknown, and to blend some of the religious ceremonies of the Greeks with the Tyrian. Besides, by their extended commerce, they became acquainted with the various kinds of superstition established in other nations, which of course would give a tincture to their own; and hence it happened, that the religion of Carthage was a very gross and multifarious idolatry. It may be also presumed, that the Greek and Roman writers, in transmitting to us the history of these people, and of the objects of their worship, would affix the notions of their own gods to those of the Carthaginians. The principal deity at Carthage was Chronus, or Saturn, to whom were offered in sacrifice children of the most distinguished families. We read that upon the signal defeat of the Carthaginian army by Agathocles, 300 citizens voluntarily sacrificed themselves in order to render him more propitious to their country. This deity had a brazen statue with extended arms, so disposed that a child presented to it dropped down into a hollow where was a fiery furnace. This deity, from various circumstances, appears to have been the Moloch or Milchem of Scripture, the famous idol of the Ammonites, Canaanites, and neighbouring nations. This is supposed to have been the same god with the Baal, Bel, or Belus of the Sidonians, Babylonians, and Assyrians. The goddes Cælestis, or Urania, was held in the highest veneration by the Carthaginians. This is supposed to have been the deity called by the prophet Jeremiah, (vii. 18. xiv. 17.) Baalith Shemai, the queen of heaven; by Megalithenes, in Ezech. Belethi; by sarcophagi, Dione and Baalits; and by Hecubus, Belthes, which name was applied both to Juno and Venus. St. Augustin informs us that Venus established her reign at Carthage; and Virgil says, that Juno preferred that spot to all others. Afteroth and Aithart were synonymous to Urania and Baalits, and denoted the moon as well as Venus and Juno, who was involved in great calamities, particularly in droughts, to obtain rain. Jupiter was worshipped by the Carthaginians under the name of Belus or Baal (see Baal); Mars also was divinized by the same title; and so were likewise Bacchus and Apollo or the sun. Baal-famen, or Baal-shemaim, that is, the god of heaven, appears to have been the sun, and Beli-rama, or the queen of heaven, the moon. The Carthaginians introduced Ceres and Proserpina as Greek deities, and also Mercury, who received divine honours under the name of Afumes or Aoumes. The worship of the Tyrian Hercules was brought to Carthage by Dido, and diffused itself afterwards over all the coasts of Africa, and as far as Gades or Cadiz, where he had a magnificent temple. Besides other honours that were rendered to him at Carthage, he was annually gratified with human victims. Jolana, as the relation of Hercules, was honoured as an object of veneration at Sardina, which island was for a considerable time in the possession of the Carthaginians. The Dea Syria, or Syrian goddes, who is supposed to have been either Juno, or a group of all the goddesses, was a deity of the Carthaginians. The people of Carthage likewise addressed themselves to

Æclusapius,
from every thing that had the least appearance of wit or
rivalry. Some of them were vain, arrogant, and ambitious
to a very high degree, and, indeed, avaricious and ambitious
seemed to be with many of them ruling powers.

As commerce, the army, and the marine, were the principal
objects of attention at Carthage, and as those engaged the pur-
poses and engrossed the thoughts of the people in general, we
cannot expect to find that they should have cultivated any very
distinguished taste for the liberal arts and sciences. However,
they must have been acquainted with the rudiments of litera-
mony, without which they could not have been tolerably ves-
ed in the art of navigation. They had some notion
like a collection of temples, magnificent palaces, rich furniture, and great
variety of arms, and domestic utensils. Their records
of literature were destroyed by the Romans; nevertheless, the
names of their principal writers have been transmitted with
honour to posterity. Hannibal, it is said, was well ac-
quainted with the Greek, and wrote several pieces in this
language. Mago, another celebrated Carthaginian general,
composed 28 volumes upon husbandry, which, after the
taking of Carthage, were held in such high estimation by
the Roman senate, that they ordered them to be translated
into Latin. Philinus, who wrote a history of the wars by
the Romans and the flight of Carthage, is reckoned by
Polybius a good though a partial historian; but no part of
his work is extant. Himilco, a sea-officer, who was deput-
cated by the senate of Carthage to discover the western shores
and ports of Europe, wrote a journal of his voyage, together
with an account of his discoveries. Hanno, another Cartha-
ginian general, failed, by order of the senate, along the coast
of Africa. Having entered the ocean through the straits of
Gibraltar, he arrived first at the island of Carthage, supposed
to be the modern isle of Arguin, which became the chief
flotilla of the Carthaginians on that coast; proceeding thence
he reached a promontory, which he called the "Well Horn," probably
Capo Palmas; and from this he advanced to an-
other promontory, which he named the "South Horn,"
which is the present Cape de Tres Palmas, about 5 degrees
N. of the line. He wrote a relation of his voyage, and a
Greek fragment of it is still remaining: the authenticity of
some of whom have doubted. See Afric.

Among other inventions ascribed to the Carthaginians,
that of the quadrirames, or four-oared galleys, deferves men-
tion; and it is not improbable, that they were the first who
made cables of the shrub "spartum" (see Carthagena); at
least they were the first who communicated this invention
to the Romans. Their navigation was extended to all the
ports of the Mediterranean, both to the east and to the west;
Britain and the Canaries are said to have been known to
them; the western coast of Africa they were acquainted
with to a considerable extent, as we have already observed;
and some have asserted, but without sufficient evidence, that
their nautical skill had led them to traverse the ocean and to
visit the coast of America. They were, however, without
doubt, for a long time universally acknowledged masters of the
sea. It must be allowed, that, with the exception of those
already mentioned, to whom we may add Clitomachus the
philosopher, called in the Punic language Afdrubal, and the
celebrated poet Terence, who was born at Carthage, the Car-
thaginians could not boast of their men of literature and
science; although they had a correspondence with Greece
and the most civilized nations, their views were directed to
trade;
trade; nor do they seem to have had any emulation to avail themselves of their learning. Eloquence, poetry, philosophy, and history seem to have been little known among them; and the education of youth, though Carthage was provided at an early period with an excellent school, must have been very much neglected. The knowledge that was principally sought and valued was reflected in a considerable degree to writing, arithmetic, book-keeping, and the buying and selling of goods; so that it was subordinate to trade. In the latter years of their state the laws forbade any Carthaginian to learn the Greek tongue, lest it might qualify him for carrying on a dangerous correspondence with the enemy, either orally or by letter.

After all, commerce, independently of the wars in which they were engaged, must occupy the chief place in the history of the Carthaginians. This formed the greatest strength and chief support of their commonwealth, and we may venture to affirm, that the power, the conquests, the credit, and glory of the Carthaginians, all flowed from trade. From their Tyrian progenitors they inherited their genius for commerce, and in process of time eclipsed the glory of their ancillors, inasmuch that Pliny derives the origin of trade, not from the Phoenicians, but from the Euxinus or Carthaginians. The natural fertility of its soil, the surpassing skill of its artificers, and its peculiarly happy situation for commerce, rendered Carthage the centre of traffic, the great mart, not only of the Mediterranean, but even of the most remote nations. Without contending for the trade of the coast with their mother-country, they extended their navigation chiefly towards the west and north. Following the course which the Phoenicians had opened, they passed the straits of Gades, and visited not only all the coasts of Spain, but those of Gaul, and penetrated at last into Britain. They also extended their refractions towards the south, and planted along the western coast of the great continent of Africa several colonies, in order to civilise the natives, and accustom them to commerce. They made considerable progress, by land, into the interior provinces of Africa, traded with some of them, and subjected others to their empire. The commodities with which they supplied other countries, seem to have been corn and fruits of all kinds; divers sorts of provisions, and high fæces; wax, honey, oil, and the skins of wild beasts, all the natural product of their own territories. Their staple manufactures were utensils, toys, cables, all kinds of naval flores, and the colour from them called Punic, the preparation of which seems to have been peculiar to themselves. From Egypt they fetched fine flax and paper; from the coasts of the Red Sea, spices, frankincense, perfumes, gold, pearls, and precious stones; from Tyre and Phoenicia, purple and scarlet, rich luffs, tapetery, costly furniture, and various artificial curiosities; from the western parts of the world, in return for the commodities carried thither, they imported iron, tin, lead, and copper. By thus purchasing the superfluities of all nations, with which they had intercourse, at an easy price, and selling them at an advanced rate, they brought immense treasures to Carthage, rendered this republic formidable to her neighbours, and enabled her to contend with Rome itself for the empire of the world. The gold and silver mines of Spain furnished the Carthaginians with an inexhaustible source of wealth. Polybius, quoted by Strabo, says, that in his time upwards of 40,000 men were employed in the mines near Nova Carthago, and supplied the Romans, at a subsequent period, every day with 25,000 drachmas, or 859l. 7s. 6d. Herilng. Besides, the Carthaginians carried on, by means of their caravans, an annual intercourse with the Perians, Garamantes, and Ethiopians; and brought from these remote nations, together with other rich commodities, catherine's of inestimable value; which gems, from the plenty of them at Carthage, were called by the ancients Carchedonian or Carthaginian. We may add, that no profession was more honourable than that of the merchant in the dominions of this state; nor is it any wonder, when we consider the numberless advantages that accrued from it. Herodotus (lib. iv.) mentions a singular mode of carrying on traffic between the Carthaginians and the Libyans, who bordered on the sea-coasts, beyond the fruits or pillars of Hercules. After they had run into some creek, they landed their goods, and leaving them exposed on a point of land, returned on board their ships. They then caused a great furnace to be raised, at the sight of which the Libyans came to the spot where the march had been left, and laying down a quantity of gold, retired a distance. The Carthaginians went on shore a second time, and if the gold appeared to them sufficient, they carried it off and failed without delay; if not, they remained quiet on board their ships for some time. The Libyans, finding they were not satisfied, made an addition to what they had before deposited; and they continued increasing the quantity of gold, till the Carthaginians were satisfied and the bargain made. Neither of these nations offered the least injustice to the other. The Carthaginians did not touch the Libyan gold till it was of equal value with their wares; nor did the Libyans meddle with the Carthaginian merchandise till the gold they offered as an equivalent was accepted and taken away. A similar mode of trade seems to have flourished among the Bedas of Ceylon. See Bedas.

In order to sketch out the history of the Carthaginians, as our limits will not admit of a minute detail, we shall distribute the duration of their state, which, according to Appian, was 700 years, and which others make 746 years, but which we consider to have been 700 years, towards the end of which the Carthaginians were engaged in the following nearly contemporary events, mentioned by Solinus, at 727 B.C., into three distinct periods or epochas. The first commences with the foundation of Carthage, in the year 883 B.C. and extends to the invasion of Sicily, in the year 480 B.C.; comprehending an interval of 403 years. The second extends from this invasion to the rupture with the Romans, in the year 264 B.C. or the commencement of the first Punic war, being an interval of 216 years. The third period lasted 115 years, during which the three Punic wars occurred; the first commenced 24 years, from the year 264 B.C. to 241 B.C.; the second commenced 17 years, from the year 221 B.C. to 204 B.C.; and the third continued 9 years, from the year 149 B.C. to 140 B.C. when Carthage was destroyed.

The first period, according to the above distribution, is imperfectly known. We have already related (see Carthage) that Elisa, known by the name of Dido, fled from Tyre in the 7th year of the reign of Pygmalion, king of that city, and landing on the coast of Africa, founded either the city of Carthage, or at least the citadel of Byrsa, by the year 814 after the troglodyte of Dido; there is a chain in the history of the Carthaginian state. During this period their whole attention seems to have been engaged in the extension of their commerce, and in forming establishments, with this view, in various parts of the world. It appears that at a very early period this republic had made considerable acquisitions in Sicily and Sardinia, and other places; and that it was formidable by sea in the time of Cyrus and Cambyse. This latter prince, in the 6th year of his reign, was obliged to abandon an expedition which he had projected against the Carthaginians, because the Phoenicians would not succour him; and hence it appears, that the whole naval power of the Perisan empire was unable to contend with that of Carthage, without the assistance of the Tyrians. In the year 508 B.C. the year after the re-
the Carthaginians concluded a treaty with the Romans, chiefly relating to navigation and commerce; and they were the first people out of Italy with whom the Romans entered into an alliance. From this treaty, which was signed 28 years before Xerxes invaded Greece, we learn, that the whole island of Sardinia, and part of that of Sicily, were then subject to the Carthaginians. At this time they were well acquainted with the coasts of Italy; and they manifested on various occasions a jealousy of the enterprise of the Romans; nor would they permit them to fail beyond the promontory called the "Fair Promontory," lying to the north of Carthage, left they should discover the fertility of the land, as well as the favourable situation of the cities, and be tempted to make a settlement. Under Mago, a Carthaginian general of consummate abilities and merit, and who is said to have first introduced military discipline among the soldiers, the dominions of Carthage were much enlarged, its commerce extended, its riches increased, and virtue alone was countenanced both in the army and the state. He left the country in the most flourishing condition, and was succeeded in his high employments by his sons Adrhnal and Hamilar. To them was committed the command of the army against Sardinia, which had revolted, and in the war that was protracted on this occasion, Adrhnal was mortally wounded. His death was much lamented by the Carthaginians. About this time the Carthaginians, determined to flake off the African yoke, by discontinuing the tribute which, by their original contract, they were obliged to pay, declared war; but being unsuccessful, it was terminated by a treaty, the chief article of which required, that the tribute as at first imposed upon them for the ground on which the city stood, should be continued. In process of time, however, the tribute was abolished. It was about this time that Darius Hyllaphis, king of Peria, sent an embassy to Carthage, requiring the inhabitants to abstain from human sacrifices, and from eating dog's flesh; to burn their dead, and not to bury them, as had been the usual practice; and to furnish him with a body of auxiliary forces to serve in the war which he had declared against Greece. With the last article the Carthaginians did not think proper to comply, because their troops were otherwise engaged. Towards the close of Darius's reign, it seems probable that an offensive and defensive league was formed between these two powers; however, it is certain, that an alliance was entered into between Xerxes, the successor of Darius, and the states of Carthage: and that the Carthaginians engaged to invade Sicily with all their forces, and endeavour to drive the Greeks from thence, as well as the continent of Italy, whilft that prince marched in person, with the whole strength of the Persian army, against Greece itself. The first settlement of the Carthaginians in Spain must have preceded the period of which we are now speaking; and it is most probable that the nerves of their power were the mines of Spain, by which they were enabled to equip such powerful fleets and collect such formidable armies; and that, by their affidavit, they made such extensive conquests in Sicily and Africa. But, though the first Carthaginian settlement in Spain must have preceded the reign of Xerxes and Darius, and even that of Cyrus, and have occurred when the city of Gades, now Cadiz, was in its infancy, yet we learn from Livy and Polybius, that the greatest part of Spain remained unfubbled till the wars of Hamilar and Hannibal. Dichorus Siculus informs us, that the Carthaginians sent a colony into the island Ebusus, or Ercus, now Yvica, 160 years after the foundation of their city; and it is highly probable, that about this time the Balearic islands, now called Majorca and Minorca, were likewise either planted or reduced by the same people, and that they were furnished by those islands with the most expert fishermen in the world, who did them great service in their battles and sieges. See BALEA R I S I N F O R E . To this period also it is reasonable to refer the first descent of the Carthaginians in Spain. As Sardinia was in the possession of the Carthaginians when they made their first treaty with the Romans, we are warranted in concluding that Carthage, separated from the former by a strait of about 3 leagues in breadth, was possessed by them, either wholly or in part, in very ancient times; and Herodotus expressly informs us, that the Cyrenians, or Carthicans, were one of those nations which enabled the Carthaginians to form that great army, with which they invaded Sicily, in the days of Gelon. After the conclusion of the treaty with Xerxes, already mentioned, the Carthaginians, in pursuance of their engagements, made great preparations for war against the Greeks of Sicily, both by sea and land. This brings us to the second period of the history of Carthage, which commenced with the year 481 B. C. The preparations for this expedition lasted 3 years, and large sums of money were sent by Xerxes from Persia to assist the Carthaginians in completing them. When every thing was ready, Hamilar, the son of Hamus, according to Herodotus, but of Mago, according to Polybius, was appointed to the command; and he failed from Carthage with 300,000 men, composed of different nations, and a fleet of above 2000 ships of war, with 3000 transports, not doubting to make an entire conquest of Sicily in the first campaign. B. C. 480. Notwithstand ing an ominous disulter in the passage, by which the horses and chariots of Hamilar perished in a storm, the general, on his arrival at Panormus, now Palermo, endeavored to dissipate the gloomy apprehensions of his followers, by representing the certainty of success, and expressing his fear lest the Sicilians, by reason of the storm, would escape the danger that threatened them. Having laid siege to Himera, he was attacked by Gelon and Theron, the tyrants of Syracuse and Agrigentum, with their united forces; and after a long and bloody contest, Hamilar was slain, and the whole Carthaginian army either put to the sword, or obliged to surrender at discretion. The Carthaginian fleet was likewise totally destroyed. The news of this defeat arrived at Carthage by one small boat, the solitary remnant of their fleet; and produced lamentation and terror through the whole city. Such was the indignation which this disulter produced in the public mind against Hamilar, that, notwithstanding all his past services, it was determined to make his family suffer; and therefore Gisco, his son, was banished, and retiring to Selinus, he died there for want of necessaries. Gelon granted the Carthaginians peace on the following terms: that they should pay two talents of silver towards defraying the expenses of the war; that they should build two temples (one to Eres and another to Proserpine) where this treaty should be deposited; and at all times be exposed to public view;—and that, for the future, they should abstain from human sacrifices. From this time to the close of the 5th, or beginning of the 5th Olympiad, B. C. 469 or 468, the Carthaginians are scarcely mentioned in the Sicilian history; though during this interval they turned their arms against the Moors, Numidians, and other African nations, and greatly extended their frontiers in Africa; they also released themselves from the tribute which they had been accustomed to pay, and became absolutely independent. They had likewise warm disputes with the people of Cyrene, the capital of Cyrenaica, and after shedding much blood, accommodated their differences by the interposition of two brothers, called Philæans, who extended their territory, and contented to be buried alive in the place fixed upon as their boundary. See PHILÆN. In the year B. C. 469, the Egestines, or Segestians, who had declared in favour
of the Athenians, against the Syracusans, dreading their re-
fentment, and being actually attacked by the people of Sel-
nuntum, implofed the aid of the Carthaginians; and for their
more effeclual succour, Hannibal, one of the Sutfetes, grand-
son to Hamilcar, and fon to Gifco, who had been exiled, was
enrolled with the command of an army, confiding, as some
say, of 200,000 foot and 4000 horfe, or, according to others,
of about 100,000. Having captured Seluntum, or Sel-
nus, with circumftances of peculiar barbarity, and also Hí-
mea, he returned to Carthage, laden with fpoils, and was
received with loud and joyful acclamations. The Carthagin-
ians, elated with this fucces, meditated the reduction of the
whole ifland of Sicily; and in the year B.C. 406, they deputed
Hannibal, aided, on account of his age and infirmities, by Im-
lickar, or Imilcon, the fon of Hanno, with a large fleet and
army, for this purpose. The campaign was opened with the
fiege of Agrigentum, which, after a vigorous resistance, was
taken and plundered, and laid in ruins. See Agrigentum.
Gela and Camarina shared the fame fate. This war
was terminated by a treaty with the tyrant Dionyfius;
after which Endorfer, who had been much weakened
by the cafes of war, and by the plague, which had
broke out in it, returned to Carthage, where this dif-
order made dreadful havoc, as it also did in other parts
of Africa.
Dionyfius, having by the fore-mentioned treaty gained
time for eftabliffing his authority at Syracuse, began his
preparations for renewing the war with the Carthaginians;
and when he had fortified the city and completed his naval
and military arrangements, he communicated his design to
the Syracusans, which was that of ifantly attack ing
the Carthaginian territories, without a previous declara-
tion of war. Accordingly in the year 357, B.C., he commenced ho-
ilities, by abandoning to the fury of the populace the perfo ns
and the defiileons of the Carthaginians who retired at Sy-
acuse, and traded on the faith of treaties. This example of
perfidiousnefs and barbarity was followed throughout the
whole ifland of Sicily. Having thus begun, he di-}spatch ed
a herald to Carthage, with a message to the senate and peo-
ple, requiring them to withdraw their garrisons from all the
Greek cities in Sicily, and threatening them, on refiufal, with
treating all the Carthaginians that were found in them as
enemies. This intelligence occafioned a general alarm
through the city, which the plague had already reduced to a
very miserable condition. But the Carthaginians, though
alarmed, were not intimidated; nor did they lose any time
in preparing for defence, and in collecting an army, the
command of which they conferred on Himilco. Diony-
fius, without waiting for their reply, put his army in motion, and
opened the campaign with the siege of Motyz, which was the
magazine of the Carthaginians in Sicily: and after a
long and obdurate refiiftance, the city was taken by inor-
mal, and all the inhabitants put to the sword, thofe ex cepted
who took ifanctuary in the temples. Himilco, unable to
prevent its capture, returned to Africa; but in the fol-
owing year he was appointed one of the Suffolkes, and re-
turned to Sicily with a far greater army than before. He
landed at Panormus or Palermo, took feveral cities, and re-
covered Motyz by force of arms. Animated by these suc-
ccefses, and also by the capture of Mefina, he advanced to-
wards Syracuse, with a defign of gaining it; marching his
infantry by land, whilst his fleet, under the command of Mago,
failed along the coast. His army confifted, as fome fay, of
300,000 foot, and 3000 horfe, or as others fay, 40,000
foot, and his fleet of 200 ships, and 500 barks. Whifh he
was making progres in the fiege, a contagious def汜-erme
dmade dreadful havoc among his troops. Dionyfius availed
himself of this favourable opportunity for attacking the
Carthaginian forces; whilst most of the ships were either
taken or burnt, great slaughter was committed in the Car-
thaginian camp; and Himilco, by a private capitulation
with Dionyfius, and for the sum of 300 talents (54,000)
according to fome, or by another estimate 61,800, ob-
tained permission to depart in the night, with all the fur-
viving citizens of Carthage, to Africa. The remainder of
his army was left to the mercy of the conqueror.
The Carthaginians received intelligence of this diflarious
event with inexpreflible grief and confternation; and Himilco,un-
able to survive his misfortune, and bewailing his own fate
and that of his country, put an end to his own life. The
news of Dionyfius's fucces induced the Africans to revolt
from the Carthaginians, whom they naturally hated, and
againft whom they were now particularly incenfed for hav-
ing faved only their own citizens, and for having left the
confederates to the mercy of the enemy. Accordingly an
army of 200,000 effective men was foon collected;
and having taken Tunis in their march, they advanced
towards Carthage; but, defirous of experienced commanders,
and undisputed command, had been obliged to difperse, and Carthage was delivered from one of the moft imminent dangers that ever threatened it. Not-
withstanding the great lofses which the Carthaginians had
sustained in the coufe of this war, which latted about five
years, they could not forbear making new attempts upon
the ifland of Sicily; and an army of 80,000 men was com-
mited to the conduct of Mago. Although he gained many
advantages, he found himself in an enemy's country, and dif-
tressed for want of provifions, he thought it most prudent to
conclude a treaty of peace with Dionyfius, and to return to
Carthage. For nine years after this peace the Carthagin-
ians feem to have enjoyed uninterrupted tranquillity; but
in the second year of the 99th olympiad, B.C. 383, Dio-
yfius, meditating a war againft them, formed a project for
improving his finances, that he might be enabled to carry it
on with succes. The Carthaginians, apprized of his in-
tentions, strengthened themselves by alliances with their neigh-
bours, and adopted all other neceflary measures for self-de-
fence. After some alternate succefses and defeats, Mago,
the Carthaginian general, and fan of the former general,
who loft his live at the battle of Cabala, concluded a peace
with Dionyfius upon condition of his ceding to the Cartha-
ginians the city and territory of Selinus, as well as that part
of the island of Agrigentum, bordering on the territory of
Selinus, and extending as far as the river Halycon, and also
of his paying them 1000 talents towards defraying the ex-
penses of the war. Between three and four years after the
conclusion of this war, (B.C. 378,) Carthage suffered much
from the plague, which swept away a very great number of its
inhabitants. The Africans and Sardinians took the advantage
of it, and made some attempts for throwing off a yoke
which was hateful and grievous; but their efforts were ine-
effectual, and they were soon reduced to their former ali-
gence. Towards the beginning of the 103d olympiad
(B.C. 368) Dionyfius, emboldened by the weakened state of
Carthage, formed an enterprise in Sicily, which was un-
succesful and terminated in a truce; but he did not long
survive this event. This truce was changed by his fon and
successor, Dionyfius II., into a perpetual peace. Soon after
this time, A. U. C. 402, (B.C. 353) the Carthaginians
concluded a fecod treaty with the Romans, nearly of the fame
tenor with the fift, excepting that the inhabitants of Tyre
and Utica were expressly comprehended in it, and joined
with the Carthaginians. After the death of the elder Dio-
yfius, Syracuse was involved in great troubles; and Dio-
yfius, the reigning prince, was under a necessity of quitting
his throne, and continuing 10 years in exile; but he was after-
wards restored, and found means to reimburse himself in his dominions. However, his temper was savage and brutal, and he exercised great cruelties among his subjects. This seemed a favourable opportunity for the Carthaginians to make themselves absolute masters of Sicily; and accordingly they equipped a large fleet, and entered into an alliance with Ictæas, tyrant of the Leontines, who had taken Syracuse under his protection. The two powers engaged, by this treaty, to unite their forces in order to expel Dionysius; and, after his expulsion, to divide Sicily between them. The Syracusans, discovering this design, applied to the Corinthians for assistance; who sent over Timoleon, a general of consummate abilities, and an ardent friend to liberty, with a body of troops to their assistance. Accordingly, in the year B.C. 345, he set sail from Corinth for Sicily with 10,000 armed soldiers, and purposing his voyage over the Ionian sea. He arrived safely, with his small fleet, at Metapontum, on the coast of Italy. From thence he advanced to Rhegium, where, by a happy stratagem, he induced the vigilance of the Carthaginians, and landed his forces at Tauromenium in Sicily. His small forces advanced boldly on the relief of Syracuse; and made his way into one part of the town before the enemy had any notice of his approach.

Here he defended himself with such resolution that he could not be dissuaded by the united powers of Ictæas and the Carthaginians. Dionysius, having surrendered the citadel to Timoleon, with all the forces, arms, and ammunition in it, escaped, by his assistance, to Corinth: and a dissatisfaction having taken place among Mago’s soldiers, in consequence of an artful representation made by the emissaries of the Corinthian general, that it was Advantageous to fee Greeks, who formed a great part of the Carthaginian army, using their endeavours to make barbarians masters of Sicily, from whence they would, in a very little time, pass over into Greece: Mago himself, wanting a pretence to retire, intimated that his forces were about to betray and defect him, and, therefore, failed with his fleet out of the harbour, and deserted Carthage. Ictæas could not maintain his position against the Corinthians; and thus they got possession of the whole city. Mago, on his arrival at Carthage, was impeached; but he prevented the execution of the sentence passed upon him, by a voluntary death. The Carthaginians, with a view of repairing the losses they had sustained, levied new forces, and sent to Sicily a greater and more powerful fleet than the former. It consisted of 200 ships of war, besides 1000 transports; and the army amounted to upwards of 75,000 men. They landed at Labrænum and Timache with 7000 men, marched out to meet them. Of the 4000 mercenaries, which composed his small army, a thousand deserted upon the march to the river Crimcus or Crimisa, on the banks of which the enemies were encamped: and yet, with perfect confidence in the value of his own soldiers, he was determined to hazard a battle. The event justified his expectations: the Carthaginians were completely routed; more than 10,000 fell on the field of battle, of whom 3000 were Carthaginian citizens, and 2500 formed what was called the sacred cohort, so that this event filled their city with mourning and consternation. Their camp was taken; and with it immense riches, and a great number of prisoners. This memorable battle was fought on the 27th day of the month Thargelion (June 13th) B.C. 340. It was followed with a treaty of peace, between Timoleon and the Carthaginians, which stipulated that all the Greek cities should be declared free; that the river Halycus or Lyuce should be the boundary between the territories of both parties; that the natives of the cities subject to the Carthaginians should be allowed to withdraw, if they pleased; to Syracuse, or its dependencies, with their families and effects; and that Carthage should not for the future afford any assistance to the remaining tyrants against the Syracusans. It was about this time that Hanno, an opulent and powerful citizen of Carthage, formed a design of subverting the constitution, and introducing arbitrary power. With a view to the accomplishment of this project, he proposed to invite the senators to a grand feast made on occasion of his daughter’s marriage; and by mixing poison with wine to destroy them all; not doubting but such a tragical event would at once make him master of the republic. The plot was discovered, but Hanno’s interest in the city was so great, that the government could not venture to punish him, even for so execrable a crime. Hanno, finding that his first stratagem was defeated, had recourse to arms, and collected together all his slaves for the execution of his purpose. This plot was also discovered. In order to avoid merited punishment, he retired with 20,000 armed slaves to a castle that was strongly fortified; and from thence fought the assistance of the Africans, and of the king of Mauritania. When all his projects had failed, he was taken prisoner, and carried to Carthage; where, after being severely scourged, his eyes were put out, his arms and thighs broken, and his body was suspended on a gibbet. His children and all his relations, though they had not participated in his guilt, shared his punishment. They were all sentenced to die, that not a single person of his family might survive, either to imitate his crime or to revenge his death. It was probably about this period, or somewhat later, that the Tyrians sent ambassadors to Carthage, to implore assistance against Alexander, but being incapable of furnishing them any succour, they dispatched 30 of their principal citizens to Tyre, to conclave with them on this afflicting occasion, and to express their concern, that the bad situation of their own affairs would not permit them to spare any troops. The Carthaginians themselves, when they heard of Alexander’s progress in the East, began to entertain apprehensions for their own safety; and deputed Hamilcar, or as Gellius says, Adrurar, famed Rhedanus, a person of wonderful address and eloquence, to wait upon that prince; and having been introduced to him by means of Parmenio, he so far ingratiated himself into his favour, as to have the honour of attending him in all his future expeditions. Having obtained this degree of confidence with Alexander, he did signal service to his country, by communicating many important discoveries relating to the conqueror’s schemes. Although the treachery of this Carthagian escaped the discovery, or even the fulmination of Alexander, he was, after his return to his own country, notwithstanding all his services, considered as a betrayer of his country, and was accordingly put to death at Carthage, by a sentence as barbarous as it was ungrateful. About the year 319 B.C. Agathocles, a Sicilian, of obscure birth and low fortune, rose into notice; and supported at first by the power of the Carthaginians, he invaded the sovereignty of Syracuse, and made himself tyrant over it. In the infancy of his power, the Carthaginians kept him within bounds, and Hamilcar, their chief, forced him to agree to a peace, which restored tranquillity to Sicily. But he soon infringed the stipulated articles of it; and declared war against the Carthaginians themselves, who under the conduct of Hamilcar, obtained a signal victory over him, near Himera, in the year B.C. 310, and forced him to flit himself up to Syracuse. The Carthaginians purified him thither, and laid siege to that important city; and if they could have taken it, they would have gained possession of all Sicily. Agathocles, finding himself deserted by his allies from an abhorrence of his cruelties, formed a most daring
and to appearance, an impracticable scheme, of transferring the war to Africa, and invading Carthage, at a time when he himself was beguiled, and had only one city left in Sicily. His profound secrecy in the execution is no less astonishing than the design itself. Without importing his scheme to any confidential friend, he merely declared that he had discovered an infallible method of reforming the Syracusans from the dangers that surrounded them, so that inconvenience would attend a short siege; but that those who chose to escape, might freely leave the city. Sixteen hundred persons quitted it; and all slaves who were able to bear arms were let at liberty, and joined his forces. With a fleet of 30 talents for the funds of his present wants he set sail with two of his sons, without informing either of his followers whether he intended to distress his foes. The Carthaginians endeavoured to prevent the departure of the fleet, but Agathocles eluded their pursuit, and made his escape to the main ocean. When he arrived in Africa, he communicated to his troops the design of this expedition and the motives that had prompted him to undertake it. The soldiers heard his speech with acclamations; flattered themselves with the prospect of foes, and thought that they were already masters of Carthage. As he approached the city, the inhabitants were alarmed, and could not help imagining that their army before Syracuse had been defeated and their fleet lost. After some deliberation, they resolved to arm the citizens; and with 40,000 foot, 1000 horse, and 2000 armed chariots, under the command of Hamanu and Bamilcar, they marched to meet the enemy, whose force composed of 13 or 14,000 men. The battle was obstinate and bloody; at length Hamanu and the sacred cohort, who long sustained the fury of the Greeks, were overwhelmed with a shower of stones, and the general fell, sword in hand; while Bamilcar proved treacherous, retired with the army under his command, and left the field to Agathocles.

After this defeat, the Carthaginians determined to recall Hamanu from Sicily; accordingly he sailed the siege of Syracuse, withdrew his troops from the place, and sent a detachment of 5000 men to reinforce the troops in Africa. Bamilcar and his remaining forces were attacked by the Syracusans; upon which, being defeated by his army, which before the engagement amounted to 120,000 foot, and 7000 horse, he was taken prisoner and carried into Syracuse. In the mean while Agathocles, having gained several advantages in Africa, was preparing to besiege Carthage itself; and advancing to the camp of the Carthaginians who covered the city, he communicated to them the dificult intelligence of the total devastation of their army in Sicily. This news filled them with consternation, and Carthage itself would have been lost, if an unexpected mutiny had not occurred in the camp of Agathocles, which proved shod in fatal to the tyrant himself, and gave the Carthaginians an opportunity of rallying and recovering strength. This was followed by an indecisive battle between Agathocles and the Carthaginians, who had sent an army to punish and reclaim Numidz, which had revolted. During these transactions, Bamilcar, who possessed the first employment in the state, attempted to effect a revolution at Carthage, and to obtain the sovereignty of that city, to which he had long aspired. A dreadful massacre was the means by which this revolution was to be accomplished; but as soon as it was known that Bamilcar was the cause of this disturbance, and that he had casted himself to be proclaimed king of Carthage, the indignation of the people was roused; the traitor was apprehended, and executed on a croas in the middle of the forum; and thus the Carthaginians were rescued from the most dangerous domestic enemy their state had ever produced. Agathocles finding himself at the head of a numerous army, assumed the title of king of Africa, and proposed soon to complete his conquests in that country by the reduction of Carthage. But after having taken Utica, he was diverted from his further progress by a commotion in Sicily, which required his presence. His son Archagathus, with whom he had entrusted the command in Sicily, was for some time successful in extending his conquests; his career of victory, however, was interrupted by some decisive advantages gained by the Carthaginians; and it became necessary to summon Agathocles from Sicily. Upon his arrival in Africa, he took the earliest opportunity that occurred of attacking the Carthaginian camp, but met with a total defeat. This disaster, together with some other unfavourable circumstances that happened, induced Agathocles to quit Africa. After his departure his two sons were affiliated by the followers, (B. C. 285.) who, chusing leaders from among themselves, concluded a peace with the Carthaginians, which was in the following year ratified by Agathocles. The Carthaginians by this peace, had all the cities restored to them, which they had formerly possessed in Sicily, and deriving this advantage from the termination of the war, they left Agathocles at liberty to pursue his designs in Sicily. Urged by his implacable hatred to the Carthaginians he prepared for a new war; but this, and other projects which he had formed, were frustrated by his death, B. C. 283. In the year, B. C. 280, Pyrrhus, king of Epirus, turned his arms against Italy; but before he landed, the Romans renewed their treaties with the Carthaginians, with an additional engagement of mutual alliance, if either of the contracting powers should be attacked by this prince. Accordingly the Carthaginians, as soon as they heard of Pyrrhus's descent in Italy, sent a fleet of 120 sail under the command of Mago; who, in an audience before the senate, signified the concern with which his principals had heard of the hostilities of Pyrrhus, and offered, in the name of his republic, a body of auxiliary troops to enable them to repel their foreign invader. The senate returned thanks for this obliging offer of the Carthaginians; but at the same time declined accepting it. Some days after this interview with the senate, Mago repaired to Pyrrhus, on pretence of offering the mediation of Carthage for terminating his quarrel with the Romans; but the real motive of this visit was to discover, if possible, what were his design with regard to Sicily, which common fame reported he was going to invade. The Syracusans, indeed, who had been for some time besieged by the Carthaginians, had sent pressing intreaties for succour to Pyrrhus. Accordingly he at last failed from Tarcentum, passed the Strait, and arrived in Sicily. His conquests were at first so rapid, that he left the Carthaginians, in the whole island, only the single town of Lilybæum. To this he laid siege, but finding a vigorous resistance, and being summoned back to Italy, he gave up his siege. Upon his departure, Sicily immediately returned to its former masters; so that he left the island with the same rapidity that he gained it. As he was embarking, turning his eyes back to Sicily, he exclaimed, "what a fine field of battle do we leave to the Carthaginians and Romans!" and his prediction was soon verified. After his departure, Hiero was appointed prætor of Syracuse and general of the Syracusan army. Under his command they obtained several advantages over the Carthaginians, and in a short time became formidable to that republic. It was not long, however, before the Romans, who were extending their views beyond the boundaries of Italy, formed a resolution of establishing themselves in Sicily; and this soon occasioned a rupture between them and the Carthaginians, which was followed by the first Punic war: and
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and with this commences the cruel period in the history of Carthage.

The first Punic war commenced in the year, B.C. 644, and it arose from the following circumstances. Some Carthaginian soldiers, who had belonged to the army of Agathocles, were kindly received at Messana, as they were leaving Sicily and embarking for their own country. But with an atrocious ingratitude and perfidy, they took occasion, in the night, either to expel or affright all the men; after which they married their wives, freed their effects, and remained sole masters of that important city. After they had divided the land and riches of the inhabitants among themselves, they called the city Mammaertina, and affirmed the name of Mamertinus, that is, a mortal or unholy people, from Mamers, a word which, in their language, signified Mars, the god of war. In imitation of their conduct, and by their affright, a Roman legion treated in the same cruel manner the city of Rhegium, which lay directly opposite to Messana, on the other side of the strait. These two perfidious cities, concurring and mutually supporting each other, became formidable to their neighbours. Messana, in particular, being very powerful, gave great alarm and uneasiness both to the Syracusanians and Carthaginians, who possessed one part of Sicily. The Romans, after the departure of Pyrrhus, determined to punish the revolters at Rhegium; and for this purpose they took the city, killed most of the inhabitants in the attack, and carried about 300, who survived, to Rome, where they were scourged, and publicly behelded in the forum. By this ignominious execution the Romans wished to terrify to their allies their own innocence and integrity. Rhegium was then restored to its lawful posterity.

The Mammaertines were thus considerably weakened; and while they were concerting means for their own safety, they disagreed among themselves, so that one party surrendered the citadel to the Carthaginians, and the other called the Romans to their assistance and refused to put them in possession of their city. Thus commenced the first Punic war. Although the Romans sent an embassage to make terms of peace, the Mamertines, who had acted a treacherous and cruel part; the people were left sporadical, and determined to affright them. With this view the confidant Appius Claudius crossed the strait with his army, and continued to enforce the vigilance of the Carthaginian general. The Carthaginians, partly by art and partly by force, were driven out of the citadel, and the city immediately surrendered to the confidant. The Carthaginians having executed their general, prepared to besiege the town with all their forces, which were also joined by those of Hiero. The confidant, however, defeated them separately, and having raised the siege, laid waste the country. This was the first expedition, which the Romans made out of Italy. Hiero afterwards entered into an alliance with the Romans, which the Carthaginians were unable to prevent. The Carthaginians, thus defeated by their ally, determined to make every possible effort for driving the Romans out of Sicily; but these efforts were so far from being effectual, that they lost several towns, and particularly Agrigentum, which Hanno, commander in chief of all the Carthaginian forces, had made a place of arms, and his principal magazine. Notwithstanding these acquisitions, the Romans were well apprized, that as long as the Carthaginians retained the dominion of the sea, it would not be in their power to drive them out of Sicily; and, therefore, they now formed the first design of having a fleet, and of disputing with the Carthaginians the empire of the sea. At this time they had not a single vessel, which they could call their own; but though they were deficient of experience in maritime affairs, they applied to them with such ardour and industry, that in two months they built 450 four-decked galleys, and after some time spent in exercising the rowers, their fleet put to sea, under the command of the confidant Dido, and sailed in quest of the enemy. The Romans, coming up with the Carthaginians near the coast of Mylae, prepared for an engagement; and, viewing themselves of a grappling instrument, called Carraia or cross, they were able to board the enemies' ships and to come to a close fight. The Carthaginian fleet consisted of 180 galleys, under the command of Hamilcar. At first the Carthaginians defied their enemies; but when they saw the above-mentioned engines nailed on the prow of every one of their ships, and found that they were thrown forcibly into their vessels so as to grapple them in spite of all resistance, they were not a little astonished. Being thus compelled to fight as if they had been on land, they were unable to sustain the attack of the Roman vessels, which produced a great slaughter among the Carthaginians, and the loss of 80 vessels. This unexpected victory raised the spirits of the Romans; and extraordinary honours were conferred on Dido, as the first Roman to whom a naval triumph was decreed. After several maritime conflicts, in which sometimes the Romans and sometimes the Carthaginians were victorious, the advantage upon the whole was on the side of the former. Determined, however, to combat the Carthaginians in their own country, they both prepared for a decisive engagement. The Roman fleet, consisting of 350 galleys, on board of which were about 140,000 men, was commanded by the consuls L. Munius Vallo and C. Attilius Regulus, and rendezvoused at Messana; and the Carthaginian squadron, composed of 350 sail, and about 150,000 men, and commanded by Hanno and Hamilcar, after assembling at Lilybaeum, took their station at Heraclea Minos. The two fleets at length came within view of each other, and made the necessary dispositions for battle. The Roman squadron consisted of four divisions; the first of which was stationed on the right and the second on the left, and the third in the rear of the other two, so as to form a triangle, the vertex of which was composed of the two admiral galleys, in which were the confidants, placed in the front of their respective squadrons. The triarii, forming the fourth division, were drawn up in the rear of the whole fleet, parallel to the third division, the base of the forementioned triangle, but extending beyond the two angles. The transports, with the horses and baggage on board, lay between the third division and the triarii, this being the situation in which they would be most secure from any attacks of the enemy. The Carthaginians, having perceived the disposition of the Roman squadron, immediately ranged their own in order of battle. They divided it into four smaller squadrons, which they drew up in one line. The three first divisions, posted to the right, stretched far into the sea, as if they intended to surround the Romans, pointing their prows directly upon them; the fourth lying to the left, kept close under shore, being disposted in the form of an outwork or tenaille. Hanno commanded on the right, and Hamilcar on the left. In this action, which was conducted on both sides with great skill and valour, the Romans lost 24 galleys; but the Carthaginians, who were entirely defeated, had 37 sunk, and 65 taken by the victors. After this battle, which happened near Heraclea Minos, Hamilcar made proposals of peace to the Romans, chiefly with a view of diverting them from the African expedition; but the Romans, rejecting the proposal, carried on the war; and the confidants, after failing for Africa, with their whole fleet, and a powerful army on board, landed at Clypea without opposition. Regulus with the forces under his command committed great ravages.
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The Carthaginians advanced to meet him; an encounter ensued, and the Carthaginians were defeated, with the loss of 17,000 men, and 18 elephants. Regulus, after this action, burnt all the open places, and, as Eutropius informs us, conquered 73 towns. Utica and Tunis were both obliged to submit, and nothing seemed now to remain but the siege of Carthage itself. To complete the misfortunes of the Carthaginians, the Numidians entered the territories of Carthage and committed such dreadful devastations, that a famine seemed to be inevitable. The African nations likewise, more immediately subject to Carthage, being weary of the Carthaginian yoke, joined the Romans. Regulus, well knowing the disfavour of the Carthaginians, offered to negotiate a peace; but his terms were so humiliating, that the Carthaginians resolved to suffer any extremities rather than submit. Regulus and the Romans were become insufferably arrogant, in consequence of their success; and after having defated the country, had advanced to the great morals, on which Carthage stood, refusing, upon the rejection of his proposals, to make the capital of an African republic. At this moment of alarm and danger, Xantippus, a Lacedaemonian of great bravery and military skill, with a body of Greek mercenaries, arrived at Carthage. Having assumed the command of the Carthaginian forces, he taught them to form all the evolutions and movements of the military art, according to the Lacedaemonian manner. The Carthaginians, thus instructed and inspired, thought themselves invincible under the conduct of Xantippus, who drew them up in order of battle in a large plain before the city, and boldly advanced towards the Romans. After calling a council of war, in deference to the Carthaginian commanders, it was resolved to give the enemy battle on the following day. Regulus was become vain and self-confident, and by his misconduct occasioned the total ruin of his army. Xantippus availed himself of the error which he committed, and either put to the sword, or took prisoners, all, except 2000 men, who broke his right wing and made their escape to Clypea. Of the Carthaginians 800 were slain; and on the side of the Romans the number of those who fell in the battle and pursuit must have been about 13,000. Xantippus took Regulus himself, and 500 of his men, prisoners in the pursuit, and immediately carried them to Carthage, where all, except Regulus, were treated with great humanity. Regulus had in his prosperity so inflicted the Carthaginians, that he is said to have been confined in a dungeon, with suffocance barely sufficient to keep him alive, and a huge elephant, at the sight of which animal he was always greatly terrified, was constantly placed near him. On this occasion the Carthaginian army did not consist of above 10,000 men, besides the elephants; and therefore, considering the number and valour of the Roman legions, this was a wonderful victory, and justly attributed to the conduct and bravery of Xantippus. This battle was fought in the year, B. C. 256. The Romans were not discouraged; but in the following campaign they put to sea with 350 vessels, and in an engagement with the Carthaginians, who met them with 200, proved victorious, took 114 ships and failed to Africa in order to bring away the small remnant of the army of Regulus. The Romans afterwards sailed, by storms and other occurrences, such prodigious losses at sea, that they entertained thoughts of declining all preparations for the future against the Carthaginians, and to leave them masters of the ocean. However they were encouraged to renew their attention to maritime operations by some favorable events of a more favourable kind; and arriving in Sicily with a fleet of 200 ships, they formed the bold design of besieging Lilybaeum, the strongest town possessed by the Carthaginians on that island, the loss of which would be attended with that of every part of it, and open to the Romans a free passage to Africa. In the prosecution of this siege the Romans encountered many lofts and disasters, and were at length reduced to the necessity of turning the siege into a blockade, and of drawing a line round the place, to prevent the garrison from receiving any succours. The besieged, on the other hand, repaired their works and determined to defend the town to the last extremity.

In the year B. C. 249, the consul Claudius put to sea with a powerful fleet in order to repriprfe Drepanum; but he was vanquished by Adherbal, a Carthaginian admiral of great conduct and bravery. Claudius, with 30 vessels, escaped out of the engagement to the camp at Lilybaeum, with intelligence of this defeat; which was the greatest ever sustained by the Romans at sea since the commencement of this war. In the consulates of Lutatius, Claudius, and Xantippus, B. C. 248, the Romans equipped a fleet of 200 vessels, at the expense of private persons; and the command was given to Lutatius. As the Carthaginian fleet had retired to Africa, the consul feized all the advantages left in the neighbourhood of Lilybaeum, and prepared for an engagement, which he knew to be inevitable, by excercising his soldiers and seamen at sea. As soon as he was informed that the Carthaginian fleet drew near, under the command of Hanno, he assembled all his forces and sailed for the small island Gergulf, which lay near Eryx, whither Hanno proposed to have repaired in order to obtain a supply for his army, and to reinforce his troops. The engagement commenced with great advantage on the side of the Romans, as their vessels were much better equipped and manned than those of the Carthaginians. They were, therefore, unable to sustain the first attack. Forty of their vessels were sunk, and seventy taken with their whole crews. The refit, favoured by a wind, which rose very favourably for them, made the bealt of their way to Hiero, the little island opposite to Drepanum, from which they had failed. There were upwards of 10,000 taken prisoners. Lutatius then advanced to the city of Eryx, where he engaged the Carthaginians, and cut off 2000 men. This last action concluded the operations of the first Punic war, in the year B. C. 241; after it had continued twenty-four years, and was followed by a peace, the terms of which were dictated by the victorious conful. The treaty, though it adjoints the interests both by sea and land of two powerful republics and their allies, is comprised in a small compass, and very clearly and accurately expressed. "There shall be peace between Rome and Carthage (in case the Roman people approve of it) on the following conditions: the Carthaginians shall evacuate entirely all Sicily; and shall no longer make war upon Hiero, the Syracusans, or their allies; they shall restore to the Romans, without ransom, all the prisoners which they have taken from them; and pay them, within twenty years, 2200 Euboic talents of silver;" amounting to 515,000l. sterling. When these conditions were brought to Rome, the people, disapproving them, sent ten commissioners to Sicily, to terminate the affair. These made no alteration as to the substan& of the treaty; but required that the time appointed for the payment of the sum demanded should be reduced to ten years; that 1000 additional talents should be paid immediately; and that the
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Carthaginians should depart out of all the islands, situate between Italy and Sicily.

Soon after the conclusion of the war waged by the Carthaginians against the Romans, they were under a necessity of commencing another with their mercenary troops, who had served under them in Sicily; which has been commonly called the African or Libyan war. It was principally occasioned by a neglect on the part of the Carthaginians in settling the arrears of their pay, or fulfilling the promises made to them by Hamno; and although it lasted only three years and four months, terminating in the year, B.C. 238, it was uncommonly barbarous and bloody. Hamno, who was employed to negociate with them at Sicca, whether they had been compelled to retire, imprudently proposed, that they should be content with receiving only a part of the arrears due to them, and remit the remainder on account of the profuse exigencies of the republic. This proposal was heard with disatisfaction and murmurs, which terminated in open rebellion. Accordingly about 20,000 of them marched towards Carthage, and encamped at Tunis, not far from that metropolis. No conciliatory measures succeeded; but the ensuing confoundment of the Carthaginians was ascribed to weakness and timidity. At length the settlement of this business was referred to some general of their own choice; and as they elected Gisco, for whom they professed great respect, he was employed to mediate between the contending parties. This general addressed them in mild and soothing language; recalled to their memories the long time they had been in the Carthaginian service, as well as the considerable sums they had received from the republic; and granted almost all their demands. When the treaty was almost concluded, two mutineers occasioned a tumult in every part of the camp. These were appointed chiefs of the furious multitude; Gisco’s tent was plundered of the money designed for the payment of the forces; and the general himself, with his attendants, were dragged to prison and treated with great indignity. All the cities of Africa, which they had solicited to join them in the recovery of their liberty, united with them; except Utica and Hipparchees, which they besieged. Carthage had never been before this time in circumstances so distressing and perilous. Every thing seemed to conspire to its ruin. The citizens drew their subsistence from the rents or revenues of their lands, and the public expenses from the tribute paid from Africa; of which they were not only deprived at once, but it was employed against them. They were also destitute of arms and forces either for sea or land; they had made no preparations for sustaining a siege, or equipping a fleet; and, to complete their misfortunes, they had not the least prospect of receiving assistance from any foreign friend or ally. At the same time they had reason to reproach themselves for numerous instances of oppression and cruelty in their conduct towards the African nations. The Africans were therefore easily prevailed upon to engage in this rebellion; and the women, whose husbands and fathers had been dragged to prison for non-payment of heavy tributes, were more exasperated than the men, and were eager to deliver up all their ornaments towards the expenses of the war. The Carthaginians, however, though deeply distressed, did not despair; but elected themselves to levying troops and fitting out ships, the command of which was intrusted with Hamno. The army of the rebels had increased to 70,000 men, and whilst they were besieging the two cities already mentioned, their camp was pitched at Tunis, and Carthage was held in a kind of blockade. Hamno’s first object was the relief of Utica; but on account of several errors with which he was chargeable in the conduct of this business, he was superseded by Hamilcar Barca. Hamilcar having obliged the rebels to raise the siege of Utica, marched against their main army, defeated part of it, and took almost all their advantageous posts. Being afterwards joined by a young Numidian nobleman, named Narvalus, with 2000 of his countrymen, he fell upon the rebels, killed 10,000 of them, and took 4000 prisoners. Those who survived were treated with singular lenity. Spondus, the chief of the rebels, with a view of counteracting this clemency and preventing a defection among his troops, engaged them in a service which would deprive them of all hopes of being remitted to the enemy; and this was no other than the murder of Gisco, and about 700 of his comrades, who had been confined with him in prison. The rebels also resolved to treat all such Carthaginians, who should fall into their hands, in the same barbarous manner. Several circumstances occurred at this time that served to dispirit the Carthaginians; one of which was the revolt of Utica and Hipparchees, the only cities which had uniformly preferred their allegiance, and always adhered inviolably to the republic, even when African authors and the Romans had made their defeats in Africa. A division also took place among their generals, and Hannibal was deputed to supersede Hamno. After Hannibal’s arrival in the camp, the affairs of the Carthaginians took a favourable turn; Hiero, king of Syracuse, afforded them assistance; and in a battle with the rebels, distressed by famine, and deprived of their chiefs who had been seized, 40,000 of them were cut to pieces. The consequence of this victory was the reduction of almost all the cities of Africa, which immediately returned to their allegiance. Hamilcar, without loss of time, marched against Tunis, which, ever since the beginning of the war, had been the asylum of the rebels and their place of arms; and Hannibal joined him in besieging it. In order to strike terror into the enemy, crocusses were set up near the walls, and Spondus was hung on one of them, and his companions who had been taken with him, on the red, and thus they all expired. Matho, the other chief of the rebels, who commanded in the city, saw what he had to expect, and became desperate in his own defence. Perceiving Hannibal off his guard, through confidence of success, he made a sally, attacked his quarters, killed many of his men, took several prisoners, among whom was Hannibal himself, and plundered his camp. He then placed Hannibal on the crocusses, in the room of Spondus, after having first made him to endure inexpressible tortures, and sacrificed around the body of Spondus, thirty citizens of the first quality in Carthage, as many victims of his vengeance. When the news of this event reached Carthage, it caused great conflagration, and it was thought advisable to make one grand effort. Accordingly, all the young persons capable of bearing arms were pressed into the service. Hamno was sent to join Hamilcar; and thirty senators were deputed to conjure those generals to forget past quarrels, and to sacrifice their resentment to their country’s welfare. Their interposition was effectual; the generals were reconciled; and from this time the Carthaginians were peaceable in all the measures which they adopted. Matho was eager to hazard a battle; and when an engagement took place, victory did not long remain doubtful. The rebels gave way, the Africans were almost all slain, and the rest surrendered. Matho was taken alive, and carried to Carthage, where he and his soldiers, after having adorned the public triumph, were led to execution, and sacrificed, by a painful and ignominious death, a life that had been polluted with the blood of treachery, and unparalleled barbarities. From the execrations of cruelty committed,
in it, Polybius informs us, that this war was generally dis-
distinguished among the Greeks by the name of the "Inex-
plicable war." During the Libyan war, the mercenaries in
Sardinia declared against the Carthaginians, excited by the
example of Matho and Spordinius in Africa. They feized
upon the person of Doftar, who commanded in the citadel
of Olbia, and massacred both him and the Carthaginian
garrison. The senate, apprised of this revolt, sent Hannu,
with a strong reinforcement of troops, to bring the muti-
neers to reason; but Hannu, on his arrival, was abandoned
by his men who joined the mercenaries, and not only cruci-
fied their leader, but put to the sword all the Carthaginians,
whom they could find in the island. They then besieged
all the cities one after another, and soon gained possession
of the whole country. Fends, however, arising between them
and the natives, the mercenaries were driven entirely out
of the island, and took refuge in Italy. Thus the Cartha-
ginians lost Sardinia, which was to them an island of great
importance, an account of its extent, its fertility, and the
great number of its inhabitants. The Sardinian war began
in the year 234 B.C. and continued three years.

The Romans ever since their treaty with the Cartha-
ginians, had behaved towards them with great justice and
moderation; and yet, notwithstanding their professions of
friendship, they countenanced and protected the fugitive
mercenaries. They sent the confid Sémporius, on trivial
pretences, with a fleet, to reestablish the malcontents, and
take possession of Sardinia, which the Carthaginians were
obliged to cede. They also obliged the Carthaginians to
defray the expense of their armament, and, besides, ex-
torted from them the sum of 1200 talents. Such perfidious
conduct could not fail of heightening the avarice Ham-
icar had already conceived, and did not a little contribute
to the second Punic war, and to those dreadful devastations
which Hannibal afterwards committed in Italy.

Hamilcar, by the happy conclusion of the Libyan war,
not only restored tranquility to the republic, but greatly
extended the conquests of the Carthaginians in Africa.
But as his country was not in a condition to commence an
immediate war with Rome, he determined, by a new plan of
operations, to place it upon a level with the imperious
republic; and with this view to make an entire conquest of
Spain, that the Carthaginians might have troops capable
of defending the kingdom. For this purpose Hannibal im-
spired both his son-in-law Afdrubal and his son Hannibal
with an implacable avarice to the Romans, as the invete-
rate enemies both of his grandeur and that of his country.
Immediately after the troubles in Africa were appeased,
the senate sent Hamilcar on an expedition against the Na-
midians, in which he conducted himself with such a degree
of skill and valour, and also with such success, that he was
vexed with the command of the army defined against
Spain. His son Hannibal, although at this time only nine
years of age, imported his father for permission to ac-
company him on this occasion; and Hamilcar having grant-
ed his request, previously ordered him to put his hand on the
altar, and to swear, that he would be an irrecusable
enemy to the Romans, and act as such when his age allowed.
He likewise took with him Afdrubal, after he had beffowed
his daughter in marriage upon that general.

As soon as the military preparations were completed,
Hamilcar advanced with a powerful army to Abysin, and
crossing the straits of Hercules, landed in Spain without
opposition. He commanded in this country during nine
years, in that interval subdued many warlike nations, and
acquired an immense treasure, which he wisely distributed,
partly among his troops, and partly among the great men at
Carthage; thus securing his interest with both these power-
ful bodies. At length, in a battle with the Vettones, or
Vettonians, a nation of Lusitania, he fell on the field, and
died gloriously, as Polybius says, at the head of his troops,
in the year B. C. 248. Upon Hamilcar's death, the army
elected his son-in-law Afdrubal, then the Carthaginian
admiral, to succeed him in the command. The choice was
confirmed by the senate; and it was amply justified by his
subsequent conduct, though Hannu and his adherents
affected to depreciate his merit. He built, or at least for-
tified, New Carthage. See Carthage. The Romans,
allured by the great proffes which Afdrubal was making in
Spain, prevailed upon him, partly by menaces, and partly by
persecution, to conclude a new treaty with them, impor-
ting, that the Carthaginians should not pass the Iberus, and
that Saguntum, a colony of Zaeuthians, and a city between
the Iberus, and that part of Spain, subject to the Carthaginians,
and as well as the other Greek colonies,
should enjoy their ancient rights and privileges. Afdrubal
did not pass beyond the limits stipulated by the treaty;
though he still pushed on his conquests, and subjected all
that part of Spain extending from the western ocean to the
Iberus, within five days' journey of the Pyrenees. His en-
gaging address and efficacious deportment made him popular
among the Reguli of Spain, and brought them over to the
interest of Carthage. Having governed the Carthaginian
dominions in Spain eight years, he was treacherously mur-
dered by a Gaul, whose master he had put to death, B. C.
220. Three years before his death, Afdrubal had written to
Carthage, requesting that Hannibal, who was then in the
24th year of his age, might be sent to him; and on his first
arrival in the camp, he manifested indications of extra-
ordinary courage and greatness of mind, and interceded the
attachment of the whole army. Under Afdrubal he made
three campaigns, and was always employed in enterprises
of the greatest importance; and after his death, the army
immediately saluted him general. At this time (viz. 226,
B. C.) he was in the twenty-seventh year of his age, ad-
mitting (See Blair's tables) that he was born in the year
247 B. C. The senate, as well as the people of Carthage,
confirmed this election, although Haman and his faction
were secretly averse from his promotion. As soon as he
affirmed the command, he commenced a plan of operations,
which all the censors approved. He began his career with
Marching against the Oceader, who were seated near the
Iberus, and having reduced Altbera, their capital, their
other towns immediately submitted. With the opening of
the next campaign he subdued the Vaccani, and prepared to
meet an army of 120,000 men, collected by the Carpetani,
one of the most powerful nations in Spain, who had been
induced to declare war against the Carthaginians. Having
routed this formidable army, he depossessed the whole
country of the Carpetani, who thought proper to submit to
the conqueror. His next object was the siege of Saguntum,
and as the inhabitants had applied to the Romans for assis-
tance, he made a vigorous effort for reducing the place before
they could take any step towards its relief. The progress
of this siege was retarded by the valiant resistance of the
Saguntines, who, by their repeated sallies, destroyed many
of the besiegers; though they were hardly fenerable of their
loss, as Hannibal's army consisted of 150,000 foot, and
20,000 horse. The fate of the city, however, was for
some time repited, by a wound which Hannibal received
as he was reconnoitring some of the works. As soon as he
recovered, hostilities recommenced, after a short cessation,
with double fury; but the Saguntines, irritated by despair,
at length forced the Carthaginians not only to abandon the

branch
began to make in the wall of the city, but to take refuge in their camp. After their return, Hannibal remained for some days in a state of motion; but, having inspired his troops with courage and promised them great rewards from the plunder of the place, they made a vigorous attack, which he placed himself on the top of a tower, which overlooked the works of the besieged and the whole city. At last the Saguntines, having defended themselves with an almost invincible valor and obstinacy, found themselves reduced by want of provisions to the greatest extremities, and to increase their distress, the Romans seemed to have entirely defeated them. In this state of despair, the senators brought all their gold, silver, and precious effects into the market place, and caused a great fire to be kindled there to burn their treasures and themselves into the flame. At this time a tower, which had been battered by Hannibal's arms, falling with a dreadful crash, the Carthaginians entered the town by the breach, soon made themselves masters of it and the citadel, and cut to pieces all the inhabitants who were able to bear arms. The reduction of Saguntum, after a siege of eight months, took place in the year B.C. 219.

The capture of Saguntum has been misrepresented as the end of the second Punic war, which commenced in the year B.C. 218. But Polybius affirms this to have been a very mistaken notion. The regret of the Carthaginians, for their having so long given up Sicily, by the treaty which terminated the first Punic war, the injustice and violence of the Romans, who took advantage from the troubles excited in Africa, to dispossess the Carthaginians in Sardinia, and to impose a new tribute on them; and the successes and conquests of the latter in Spain, were the true causes of the violation of the treaty, as Livy (agreeing with Polybius) intimates, in few words, in the beginning of his history of the second Punic war.

When the news of the reduction of Saguntum arrived at Rome, it occasioned inexpressible grief and consternation. As soon as the Romans were able to refrain or suppress the first emotions occasioned by this humiliating and discrediting intelligence, an assembly of the people was convened, and war against the Carthaginians was unanimously decreed. That no ceremony might be wanting, deputies were sent to Carthage, to inquire whether Saguntum had been besieged by order of the republic, and if so, to declare war; or, in case this siege had been undertaken solely by the authority of Hannibal, to require that he should be delivered up to the Romans. The deputies perceiving that the senate gave no direct answer to their demands, one of them took up the folded lappet of his robe, "I bring here," says he in a hearty tone, "either peace or war; the choice is left to yourselves." The senate answering that they left the choice to him: "I give you war then," says he, unfolding his robe. "And we," replied the Carthaginians, with the same haughtiness, "as honestly accept it, and are resolved to execute it without the farther ceremony." When war was resolved upon and proclaimed on both sides, Hannibal, who, after the reduction of Saguntum, had put his troops into winter-quarters at New Carthage, and remained during the winter in a state of inaction, made several wise regulations for the security of the Carthaginian dominions in Spain and Africa. With this view he marched the forces out of the one into the other, so that the Africans served in Spain and the Spaniards in Africa. The command of the Spanish forces was entrusted by Hannibal with his brother Afdrubal, with a fleet of about 63 ships to guard the coasts; and he also gave him the chief counsel for the direction of his conduct. Before Hannibal himself set out for his expedition, he went to Gaul or CarOutputStream
to make another effort with alacrity, from one of the high-<br>cell hills he gave them a prospect of the fruitful plains wa-<br>tered by the Po, the day before he decamped. He likewise<br>pointed towards the place where Rome stood; which, he<br>said, a battle or two would make them masters of, and<br>consequently put a glorious period to all their toils. This<br>prospect inspired them with such vigour, that they<br>seemed to have forgot all the sufferings they had undergone,<br>and to think only of taking possession of that haughty city,<br>whose conquest towards their state had been nothing but one<br>continued series of insults since the conclusion of the Sicilian<br>war.<br>
They therefore pursued their march; but the difficulty<br>and danger increased, in proportion as they approached<br>nearer the end of the defeat. We are told, that about this<br>time Hannibal meditated a retreat; but from the genius of<br>that general, as well as the whole tenour of his conduct, this<br>conjecture seems highly improbable. To omit many<br>particulars, they came at last to a path naturally very steep<br>and craggy; which being rendered impracticable by the<br>late falling of the earth, terminated in a frightful precipice<br>above a thousand feet deep. In short, Hannibal found it<br>would be impossible to accomplish this design, without cut-<br>ting a way in the rock itself, through which his men, horses,<br>and elephants might pass; and this, with immense labour,<br>he effected. Approaching, therefore, gradually the In-<br>brian foot of the Alps, he detached some parties of his<br>horse to forage, there appearing now some spots of pature<br>where the ground was not covered with snow. Livy in-<br>forms us, that in order to open and enlarge the path, large<br>trees were felled, and piled round the rock, after which fire<br>was let to them. The wind, by good fortune, blowing<br>hard, a fierce flame soon broke out; so that the rock glowed<br>like the very coals with which it was surrounded. Then<br>Hannibal, according to the same author, caused a great<br>quantity of vinegar to be poured on the rock; which pierc-<br>ing into the veins, that were now cracked with the intense<br>heat of the fire, calcined and softened it. In this manner,<br>taking a large compass, in order that the defeat might be<br>easier, he cut a way along the rock, which opened a free<br>passage to the forces, baggage, and elephants. As Poly-<br>bius has paffed over in silence the use Hannibal made of<br>vinegar on this occasion, many regret that incident as<br>fabulous.<br>
At length Hannibal gained the fruitful plains of Insfubria,<br>where, in reviewing his army he found, that in five months<br>and a half's march (for so long was it since he had left New<br>Carthage), he had lost by sickness, defection, fatigue, and<br>various engagements, thirty thousand foot, and three thou-<br>sand horse. His army now amounted to no more than<br>twenty-six thousand effective men. Above twenty thousand<br>had perished since his departure from the Rhodanus. That<br>we may have a more distinct idea of Hannibal's march, it<br>will be proper to give the names and distances of some of<br>the principal places through which that general passed in<br>his way to Italy, transferred from Polybius. From<br>New Carthage to the Iberus were computed two thousand<br>six hundred italies; from the Iberus to Emporion, a small<br>marine town, which separated Spain from the Gauls, ac-<br>cording to Strabo, fifteen hundred italies; from Emporion<br>to the banks of the Rhodanus, fifteen hundred italics;<br>from the Rhodanus to the Alps, fourteen hundred italics;<br>from the Alps to the plains of Insfubria, twelve hundred<br>italics. In all eight thousand four hundred italics, making<br>much about a thousand English miles.<br>
Upon Hannibal's arrival in Italy he refreshed his troops,<br>and then marched against the Taurini, who had refused to<br>enter into an alliance with him; and having encamped be-<br>fore Taurium (Turin) their chief city, he carried it in<br>three days, and put all who had opposed him to the sword.<br>This expedition so terrified the neighbouring Gauls, that<br>they surrendered at discretion. The rest of the Gauls<br>would probably have followed their example, if they had<br>not been awed by the terror of the Roman arms, which<br>were now approaching. Hannibal therefore, as he had no<br>time to lose, thought it the wisest course which he could<br>pursue to march directly into their country, and to make<br>such an attempt as would induce those who had an inclina-<br>tion to join him to put themselves under his protection.<br>They therefore pursued their march; but the difficulty<br>and danger increased, in proportion as they approached<br>nearer the end of the defeat. We are told, that about this<br>time Hannibal meditated a retreat; but from the genius of<br>that general, as well as the whole tenour of his conduct, this<br>conjecture seems highly improbable. To omit many<br>particulars, they came at last to a path naturally very steep<br>and craggy; which being rendered impracticable by the<br>late falling of the earth, terminated in a frightful precipice<br>above a thousand feet deep. In short, Hannibal found it<br>would be impossible to accomplish this design, without cut-<br>ting a way in the rock itself, through which his men, horses,<br>and elephants might pass; and this, with immense labour,<br>he effected. Approaching, therefore, gradually the In-<br>brian foot of the Alps, he detached some parties of his<br>horse to forage, there appearing now some spots of pature<br>where the ground was not covered with snow. Livy in-<br>forms us, that in order to open and enlarge the path, large<br>trees were felled, and piled round the rock, after which fire<br>was let to them. The wind, by good fortune, blowing<br>hard, a fierce flame soon broke out; so that the rock glowed<br>like the very coals with which it was surrounded. Then<br>Hannibal, according to the same author, caused a great<br>quantity of vinegar to be poured on the rock; which pierc-<br>ing into the veins, that were now cracked with the intense<br>heat of the fire, calcined and softened it. In this manner,<br>taking a large compass, in order that the defeat might be<br>easier, he cut a way along the rock, which opened a free<br>passage to the forces, baggage, and elephants. As Poly-<br>bius has paffed over in silence the use Hannibal made of<br>vinegar on this occasion, many regret that incident as<br>fabulous.<br>
At length Hannibal gained the fruitful plains of Insfubria,<br>where, in reviewing his army he found, that in five months<br>and a half's march (for so long was it since he had left New<br>Carthage), he had lost by sickness, defection, fatigue, and<br>various engagements, thirty thousand foot, and three thou-<br>sand horse. His army now amounted to no more than<br>twenty-six thousand effective men. Above twenty thousand<br>had perished since his departure from the Rhodanus. That<br>we may have a more distinct idea of Hannibal's march, it<br>will be proper to give the names and distances of some of<br>the principal places through which that general passed in<br>his way to Italy, transferred from Polybius. From<br>New Carthage to the Iberus were computed two thousand<br>six hundred italias; from the Iberus to Emporion, a small<br>maritime town, which separated Spain from the Gauls, ac-<br>cording to Strabo, sixteen hundred italias; from Emporion<br>to the banks of the Rhodanus, fifteen hundred italas;<br>from the Rhodanus to the Alps, fourteen hundred italas;<br>from the Alps to the plains of Insfubria, twelve hundred<br>italias. In all eight thousand four hundred italas, making<br>much about a thousand English miles.<br>
Upon Hannibal's arrival in Italy he refreshed his troops,<br>and then marched against the Taurini, who had refused to
battle, Hannibal not having opportunity of inflaming his impetuous spirit, and of accelerating the action in which he wished to engage. He therefore laid waste with fire and sword the country through which he passed, and advanced in his progress towards Rome. Having gained an eminence, at the termination of a narrow defile formed by the mountains of Cortonum and the lake Thurmfemone, being purged by the Roman confid, he prepared for battle; and the event was the total defeat of the confederate army. Flaminius himself with 15,000 men were laid dead on the field, and about 10,000 escaped to Rome by different roads. Hannibal lost only 1500 men, most of whom were Gauls; though great numbers both of his soldiers and of the Romans died afterwards of their wounds. Having made diligent but ineffectual search for the body of Flaminius, for the purpose of giving it an honourable burial, he put his troops into quarters of refreshment, and solemnized the funerals of 50 of his chief officers, who had been slain in the action. This battle was fought in the year B.C. 217. Hannibal, not thinking it proper to advance directly to Rome, pursued his route through Umbria and Picenum; and after ten days' march arrived in the territory of Adria. As he plundered the country through which he passed, he was loaded with booty. Having attacked Spoleto, and being repulsed with loss, he proceeded to the frontiers of Apulia, and ravaged the adjacent territories. Polybius informs us, that Hannibal treated the allies of the Romans with the utmost cruelty in this expedition. At this time Fabius, followed by Minucius and four legions, had marched from Rome in quell of the enemy; but with a firm resolution not to let him take the leaf advantage, nor to advance one step till he had first reconnoitered every place; nor hazard a battle, till he should be sure of success. Hannibal made various attempts to provoke Fabius to a battle, but they were all ineffectual. The dictator, notwithstanding all the artifices, the marches, counter-marches, and feints, of the Carthaginian general, inflexibly adhered to his first resolution, and gave his crafty enemy to understand, that the Romans, instructed by their defeats, had at last made choice of a general capable of opposing Hannibal. Reflected on leaving Campania with his immense spoils, Hannibal marched with his army towards the confines of Samnium; but was much incommode of his progress by the prudent dispositions and movements of Fabius. Having encamped at the foot of the mountains, he found himself involved in great difficulties, as the Romans had seized upon Castrinum and Callicula, and pent up his army in such a manner, that it seemed impossible for him to escape. Whilst Fabius was preparing for an attack, the inventive genius of Hannibal contrived a stratagem, by which he eluded the efforts of the Roman dictator, and preferred both himself and his army, when they were upon the very brink of destruction. He afterwards returned to Apulia, and having taken the town of Germanium by assault, made this the place of his encampment. In the mean time, Fabius, being ordered to Rome, left the command of the army to Minucius, his general of horse, with orders to observe the motions of Hannibal at a proper distance; but by no means to engage him. The sequel is related under the article CAMPA, where the Carthaginian general obtained a complete victory over the Romans. See also CAMPA.

Whilst Hannibal was purging his conquests in Italy, the Carthaginian affairs in Spain, in consequence of the defeat of Adrabil by Scipio, began to wear an unpromising aspect. Scipio, improving his naval victory, took Honofca by storm, and leveled it with the ground. From thence he proceeded to New Carthage; laid waste the adjacent territory, and set fire to the suburbs of that city. He also obtained several other advantages in the island Ebora, now Yville, and in other places; and concluded a treaty with the inhabitants of the Balearic islands. After these exploits Livy says, that 20 different nations of Spaniards submitted to the Romans, and Adrabil was compelled to retire into Lusitania, and the parts of Spain, that border upon the ocean. The Carthaginian commander was also reduced to great difficulties by the interruption of the Carthaginian princes, under the order of Scipio, into the Carthaginian territories; by their capture of three fortresses; and by two defeats, in which 15,000 men belonging to Adrabil's army were killed, and 45,000 taken prisoners. The two Scipios in this campaign passed the Ebro, and penetrated into the Carthaginian dominions, as far as Saguntum. Whil'st their arms were making considerable progress in Spain, Adrabil received orders from Carthage to march into Italy for the relief of his brother; but the two Roman generals resolved to prevent, if possible, his leaving Spain. They therefore forced him to fight, and defeated him, so that he could neither continue his march for Italy, nor remain with any safety in Spain. In Sardinia the Carthaginians were no less unsuccessful; for, in a battle fought against the Romans, they lost 12,000 men, and a greater number of prisoners, among whom were Adrabil, named Calvus, Hanno, and Mago, who were distinguished by their birth as well as military exploits. Afterwards the face of affairs was very much changed in Spain. The two Scipios were defeated and killed, and the Roman territories in that country seemed to be inevitably lost. They were preferred, however, by the valour of L. Marcus, a private officer of the Equestrain order; and shortly after, the younger Scipio was sent thither, who revenged the death of his father and uncle, and restored the affairs of the Romans in Spain to their former flourishing condition. From the period of Hannibal's absence at Copua, the Carthaginian affairs in Italy no longer supported their reputation. M. Marcellus, first as pretor and afterwards as consul, contributed very much to this revolution. He harassed Hannibal's army on every occasion, forced upon his quarters, forced him to raise siege, and even defeated him in several engagements; so that the latter called the siege of Rome, as Fabius had before been named his butcher. But what most affected the Carthaginian general, was to see Carthage besieged by the Romans. In order to preserve his reputation among his allies, he flew to his relief, attacked the Romans, and fought several battles in order to oblige them to raise the siege. But all his measures for this purpose being defeated, he marched hastily towards Rome, that he might thus make a powerful diversion. Rome was at first much alarmed; and one of the senatorss proposed to recall all the armies to succour the capital. Fabius, however, declared, that it would be shameful in them to be terrified, and forced to change their measures upon every motion of Hannibal. They, therefore, contended with themselves recalling only part of their army; and whilst Hannibal and the Roman confid, having drawn up their respective armies before the city, were preparing for a decisive battle, of which Rome was to be the recompense, a violent storm obliged them to separate. When they again repeatedly rallied, the same impediment to action occurred; so that Hannibal, believing something supernatural in the event, said, according to Livy, that sometimes his own will, and sometimes fortune, would not suffer him to take Rome. At length he retired, and in his march plundered the rich temple of the goddess Feronia. The success of the Romans in the siege of Copua gave them a visible superiority over the Carthaginians; and displayed, at the same time, how formidable
able the power of the Romans was, when they undertook to punish their perfidious allies; and the feeble protection which Hannibal could afford his friends, at a time when they most wanted it. It remains that we mention one unforeseen defeat that ruined all the measures, and baffled all the hopes of Hannibal with regard to Italy. The confu

sion of the 11th year of the second Punic war (B.C. 207.) were C. Claudius Nero, and M. Livius. The province of the latter was the Cisalpine Gaul, where he was to oppose Afdruibal, who, according to report, was preparing to pass the Alps. The former commanded in the country of the Bruc
tians, and in Lucania, that is, in the opposite extremity of Italy, and was there making head against Hannibal. The passage of the Alps gave Afdruibal very little trouble: the way having been previously cleared by his brother, and all nations being disposed to receive him. Some time after this he dispatched couriers to Hannibal, who were intercepted; and by their letters Nero found, that Afdruibal was hastening to join his brother in Umbria. In order to disconcert and defeat this plan, Nero set out with a detachment of his army consisting of 7000 men, and marching with extraordinary diligence, joined the other confeder in the night. When Afdruibal discovered, by reconnoitering the enemy's army, that the fresh troops were arrived, he concluded that they belonged to the other confeder, and was thus led to conjecture, that his brother had sustained a considerable loss, and also to fear, that he was come too late for his assistance. He therefore founded a retreat, and his army began to march in great disorder. Whilst he was preparing to cross the river Metaurus, the army of the enemy came up with him, and in this extremity it was impossible to avoid an engagement. The battle that ensued was long and obstinate; and Afdruibal distinguished himself by his self-possession and valor. At length, when victory declared for the Romans, being unable to survive the loss of so many thousand men, who had quitted their country to follow his fortune, he rushed at once into the middle of a Roman cohort, and there died in a manner worthy of the son of Hamilcar, and brother of Hannibal. This was the most bloody battle which the Carthaginians had fought during this war; and whether we consider the death of the general, or the slaughter made of the Carthaginian forces, it may be looked upon as a reprimand for the battle of Cannae. The Carthaginians lost 55,000 men, and 6000 were taken prisoners. The Romans lost 8000. These were so weary of killing, that some professed Livius, that he might very coldly cut to pieces a body of the enemy who were flying: "It is fit," says he, "that some should survive, in order that they may carry the news of this defeat to the Carthaginians." Afdruibal's head was thrown into the camp of the Carthaginians, informed Hannibal of his brother's fate. Hannibal perceived by this cruel stroke the fortune of Carthage; "It is done," says he, "I will no longer trust triumphant messengers to Carthage. In loosing Afdruibal, I have lost at once all my hope, all my good fortune." He afterwards retired to the extremity of the country of the Bruc
tians, where he assembled all his forces, who found it a very difficult matter to subdue there, as no provisions were sent them from Carthage. The fate of arms was not more propitious to the Carthaginians of Spain. The three Carthaginian generals in that country, Afdruibal, son of Gifeo, Hamo, and Mago, having been defeated with their numerous armies, by the Romans, in several engagements, Scipio the younger at last possessed himself of Spain, and subjected it entirely to the Roman power. Upon his return to Rome, he was declared consul, at the age of 30 years, and Sicily was allotted to him. He set out with all imaginable expedition for this province; whilst his colleague in the consulate, P. Licinius Cæfalus, was to command in the country to which Hannibal had re
tired. Soon after Scipio crossed over to Africa, the latter made this country the seat of war. The devastation of the country; the siege of Utica; the entire defeat of the two armies under Syphax and Afdruibal, whose camp was burned by Scipio; and afterwards the capture of Syphax himself, in whom the Carthaginians repaid their chief confidence;—all these things forced them at last to turn their thoughts to peace. Accordingly, they deputed 30 of their principal senators, selected out of the powerful body at Carthage, called the "Council of the Hundred," to wait on the Roman general in his tent; who accused Hannibal as the author of all their calamities, and promised, in the name of the senate, an implicit obedience to whatever the Romans should please to order. Scipio replied, that he would grant them a peace, upon condition that they should deliver up all the prisoners and defectors to the Romans; that they should recall their armies out of Italy and Gaul; should never again set foot in Spain; should retire out of all the islands between Italy and Africa; should deliver up all their ships, 20 excepted, to the victor; should give to the Romans 500,000 bushels of wheat, 300,000 of barley, and pay 10,000 talents—and that, in case they were pleased with these conditions, they then might send ambassadors to the senate. The Carthaginians yielded compliance, in order to gain time till Hannibal returned. A treaty was then granted to the Carthaginians, who immediately sent deputies to Rome, and at the same time an express to Hannibal to order his return into Africa. Hannibal received the orders from Carthage with inexplicable concern; and he returned home, turning his eyes wistfully to Italy, accrying gods and men of his misfortunes, and calling down a thou
tand curses, as Livy says, upon himself for not having marched his soldiers directly to Rome after the battle of Cannae, whilst they were still recking with the blood of his citizens. The decision of the whole matter was referred by the Roman senate to Scipio, who, being upon the spot, could best judge what conditions were most suitable to the welfare of the state. About this time a Roman fleet of about 200 vessels of burthen was dispersed near Carthage by a storm; and Afdruibal failed out of the harbour, by order of the senate, seized the greatest part of them, and brought them to Carthage, though the truce was still fulfilling. This act of aggression was complained of by Scipio; but his remonstrances were little regarded by the Carthaginians. Hannibal's approach had revived their courage, and inspired them with very flattering hopes. This circumstance afforded a new occasion of war between the two nations. Hannibal, now deeming peace more than a renewal of the war, flattered himself that the conditions of it would be more honourable, as he was at the head of an army, and as the fate of arms might still appear uncertain. He therefore solicited an interview with Scipio, which was agreed to at a time and place that was fixed. This interview proving ineffectual, the generals left one another with a resolution to decide the fate of Carthage by a general battle, fought on the plains of Zama, about five days' march from Carthage, in the year B. C. 202. The Carthaginians, after a very obstinate fight, were obliged to fly, leaving 20,000 men on the field of battle, and the like number of prisoners were taken by the Romans. Hannibal escaped in the tumult, and entering Carthage, owned that he was irrecoverably defeated, and that the citizens had no alternative left, but the acceptance of peace on any conditions. Thirty deputies waited upon the conqueror at Tunis, and sued for peace on the most submissive terms. Scipio called a council, the majority of which were for
racing Carthage and treating the inhabitants with the utmost severity. But the consideration of the time which it would require before a city to strongly fortified could be taken, and Scipio's fear left a successor might be appointed to him whilst he should be employed in the siege, made him incline to clemency. Accordingly a peace, terminating the second Punic war, was concluded between the Carthaginians and Romans, upon the following conditions dictated by Scipio: “that the Carthaginians should continue free and preserve their laws, their territories, and the cities they possessed in Africa before the war—that they should deliver up to the Romans all their fenders, flaves, and captives belonging to them; all their ships, except 10 vessels; all their tame elephants, and that they should not train up any more for war:—that they should not make war out of Africa, nor even in that country, without first obtaining leave for that purpose from the Roman people:—that they should restore to Mafinissa all they had dispersed either him or his ancestors of:—that they should furnish money and corn to the Roman auxiliaries, till their ambassadors should be returned from Rome:—that they should pay to the Romans 10,000 Euboic talents of silver, (1,750,000l.) in 50 annual payments; and give 100 hostages, who should be nominated by Scipio:—3rd in order that they might have time to send to Rome, it was agreed to grant them a truce, upon condition that they should restore the ships taken during the former war, without which they were not to expect either a truce or peace.” Soon after the treaty of peace with the Romans, an article in this treaty involved the Carthaginians in a dispute with Mafinissa. This article required them to restore to Mafinissa all the territories and cities which he possessed before the war; and, moreover, Scipio, in recompense of the zeal and fidelity which that monarch had shown with regard to the Romans, had added his dominions to those of Syphax. From this circumstance originated the contention that afterwards took place between the Carthaginians and Mafinissians. Syphax and Mafinissa were both kings in Numidia; but occupied different parts of this country. The subjects of the former were called Mafafelli, and their capital was Carth: those of the latter were the Mufylli; but the name of Numidian was common to both. Their principal strength consisted in their cavalry; and they always rode without saddles, and even without bridles, whence Virgil (Aen. i. iv. 541.) called them “Numidi Infranti.” A contest having occurred between these two princes, in the progrès of which Syphax was defeated and captured, the dominions of this prince were bestowed upon Mafinissa, and the Carthaginians were obliged to restore all which he possessed before. Mafinissa had likewise seized part of a fertile territory, situated towards the sea-side, near the lesser Syrtes, which had been consecrated to pay tribute to the Carthaginians. Appeals had been made to Rome; but the contest remained undecided, though it was evident that the Roman senate favoured Mafinissa. In a course of time the Carthaginians farther remonstrated against the encroachments of the Numidian prince; and complained to the senate of Rome, that, besides the lands at first contested, he had dispersed them of upwards of 50 towns and castles. They likewise stated that they were restricted from seeking redress by the above-mentioned article of the last treaty. To their earnest application, and the counter-statement of Mafinissa, the Roman senate replied, that the ancient limits should be preferred; and that it was far from being their intention to have the Carthaginians dispersed, during the peace, of those territories and cities which had been referred to them by the treaty. But these assurances, apparently impartial and even favourable to the Carthaginians, were mere words. The Romans were secretly in the interest of Mafinissa, and contrived the business, in order to give him an opportunity of establishing himself in his dominions, and of weakening his enemies. A new dispute was next to arise from Rome in order to settle the dispute; and Cato was one of the commissioners. Mafinissa professed to acquiesce in their decision; and the Carthaginians avoided their adherence to the treaty which they had concluded with Scipio. The dispute, after having visited the country and examined the state of Carthage, expressed their acknowledgment, that, after the calamities which it had suffered, it should have risen again, and to soon, to such a pitch of power and grandeur. When the numbers of the senate received this intelligence from the deputies, they declared, that Rome must never be in safety so long as Carthage should indulge. From this moment, whatever affair was debated in the senate, Cato always uttered the following words to his opinion: “I conclude that Carthage ought to be destroyed.” At this time divisions brooked in Carthage: 40 citizens were sent into banishment; and the exiles withdrew to the court of Mafinissa, who sent his sons to Carthage, to solicit their return. But the gates of the city were shut against them, and one of them was closely pursued by Hamilcar, one of the generals of the republic: this gave occasion to a new war; armies were levied on both sides; and a battle was fought in the presence of the younger Scipio, which afterwards named Carthage. The fight was long and obstinate, but at last the Carthaginians gave way. When the battle had terminated, the Carthaginians intreated Scipio to put an end to their contests with Mafinissa; but having completed the object of his mission, he returned to Rome without settling the dispute, and reconciling the contending parties. In the progress of the contest, the Carthaginians, reduced to the greatest extremity by famine and the plague, surrendered to Mafinissa, promising to deliver up the defectors, to pay him 5000 talents of silver in 50 years, and to restore the exiles, notwithstanding the oaths by which they had bound themselves to the contrary. They all submitted to the ignominious ceremony of passing under the yoke, which was a kind of gallows, made by two forked flocks flanding upright, with a spear laid across, under which vanquished enemies were obliged to pass: and of 58,000 men, very few returned to Carthage.

The Carthaginians in this humbled and distressèd state renewed their application to Rome; but their deputies, commissioned once and again to the senate, returned without satisfaction. At Rome disputes occurred between Cato and Scipio Nasica with respect to the measures that were proper to be pursued. Cato delivered a speech, in which he decried on the powerful and prosperous state of Carthage, and ending his speech threw down some African boys, the size and beauty of which were much admired by the senators: “Know,” says he, “that it is but three days since these boys were gathered; such is the distance between the enemy and us.” Nasica, on the contrary, was of opinion, that the Carthaginians were too weak to subdue the Romans, and, at the same time, so powerful, that it was not for the interest of the Romans to consider them in a contemptible light. The senate, however, resolved to declare war against the Carthaginians; and the reasons or pretences for it were, their keeping up ships, contrary to the tenor of treaties, and their sending an army out of their territories, against a prince who was in alliance with Rome, and whose son they treated ill, at the time he was accompanied by a Roman ambassador. At the moment of their deliberation, deputies arrived from Utica, the second city of Africa, polifpering a spacious harbour, and within 60 furlongs of Carthage, so that it might
force as a place of arms in the attack of that city, surrendering themselves, their effects, their lands, and their city, into the hands of the Romans. They, therefore, hesitated no longer; but immediately proclaimed war, committing the conduct of it to the consuls Mamilius and L. Marcus Censorinus, and giving them their first orders for the war but by the destruction of Carthage. To them was committed a considerable fleet, on board of which were 80,000 foot, and about 4000 horse. Thus commenced, in the year B.C. 149, the third Punic war, about 53 years after the termination of the second, which, though much less considerable than either of the former, with regard to the number and importance of the battles that were fought, and its continuance, which was less than 4 years, was nevertheless much more remarkable, with respect to the fierceness and event of it, as it ended in the total destruction and ruin of Carthage.

As soon as the Senate had formed its resolve, a courier was sent to Carthage with its decree, and with information that the Roman fleet had sailed. After many former and recent lofes, which the Carthaginians had sustained, they were by no means in a condition to resist such an enemy, since they had not been able successfully to oppose Mamilia. Troops, provisions, ships, allies. in a word, every thing was wanting; and hope and vigour more than all the rest. As soon as it was known that the fleet was arrived at Utica, the deputies of Carthage repaired to the Roman camp, signifying that they were come in the name of the republic, in order to receive their commands, which they were ready to obey.

The consul required the immediate surrender of all their arms. The order was instantly complied with; and there arrived in the camp a large train of wagons, loaded with all the preparatory implements of war, taken out of Carthage; 200,000 complete suits of armour, a numberless multitude of darts and javelins, with 2000 engines for floating darts and stones. The deputies, accompanied by the most venerable senators and priests, followed, and received from Censorinus the consul, the heart-rending decree of the Senate, 'that it was their absolute will and pleasure that you depart out of Carthage, which they have resolved to destroy, and that you remove into any other part of your dominions, as you shall think proper, provided it be at the distance of 80 statis from the sea.' This decree was received with the most bitter anguish, and when it was communicated to the people, nothing was seen and heard in every part of the city but howling and despair, madness and fury. After this transference, the consuls made no great haste to march against Carthage, as they knew the city was disarmed. However, the inhabitants, being unanimously resolved not to quit the city, took the advantage of this delay to put themselves in a posture of defence. They appointed as general, without the walls, Afdrrabal, who was at the head of 20,000 men, and within the walls the command was given to another Afdrrabal, the grandson of Mamilia. They then applied with great diligence and expedition to the manufacture of arms. The temples, the palaces, the open markets and squares, were all changed into arsenals, where men and women worked day and night. Every day were made 100 shields, 300 swords, 700 pikes or javelins, 1000 arrows, and a great number of engines to discharge them; and because they wanted materials to make ropes, the women cut off their hair for this purpose. During this interval the consuls were advancing towards the city in order to besiege it. The Carthaginians defended themselves with incredible resolution and vigour; and renewed the bold old stances, for repelling the besiegers, burning their engines, and harassing their foragers. Censorinus attacked the city on one side, and Manuelius on the other. Scipio, afterwards named Africanus, was then a tribune in the army; and distinguishing himself above the rest of the officers, by his prudence as well as his bravery. The besieged, though thus powerfully affailed, were recovering their spirits, in consequence of some advantages which they gained. Their troops increased, and they obtained an accession of allies. This news occasioned some uneasiness at Rome; but the fame of Scipio had also arrived in the city; and when he appeared in the assembly, as a candidate for the multitude, a general perfuasion prevailed, that he was designed by the gods to end the third Punic war, as the first Scipio, his grandfather by adoption, had terminated the second. Indeed, therefore, of granting him the multitude, for which he was a candidate, they foronce disregarded the laws, and conferred upon him the consulship, assigning him Africa for his province. As soon as Scipio had compleated his recruits, he set out for Sicily, and soon after arrived at Utica. Immediately upon his arrival, he revived the discipline among the troops, and made several necessary regulations. Having ordered his troops to provide themselves with axes, levers, and scaling ladders, he led them in the dead of the night, and without the least noise, to a district of the city called Megara; when ordering them to give a general and sudden shout, he attacked it with great vigour.

The enemy, though somewhat terrorized by this unexpected attack, defended themselves so courageously, that Scipio could not scale the walls. But perceiving a tower that was forfaken, and which stood without the city, near the walls, he detached thither a party of intrepid soldiers, who, by the help of pontons, got from the tower to the walls, and from thence into Megara, the gates of which they broke down. Scipio entered it immediately after, and drove the enemies out of that part; who, terrified at this unapprehended assault, imagining that the whole city was taken, fled into the citadel: whether they were followed even by those forces that were encamped without the city, who abandoned their camp to the Romans, and thought it necessary to fly into a place of security. At day-break, Afdrrabal perceiving the ignominious defeat of his troops, in order to be revenged on the Romans, and at the same time, to deprive the inhabitants of all hopes of accommodation and pardon, brought all the Roman prisoners he had taken upon the walls, in the sight of the whole army. There he put them to the most exquisite tortures; putting out their eyes, cutting off their noses, ears, and fingers; tearing their skin to pieces with iron rakes or harrows; and then threw them headlong from the top of the battlements. This inhuman treatment filled the Carthaginians with horror; however, he did not spare even them, but murdered many senators who had been so brave as to oppose his tyranny. Scipio, having made himself absolute master of the illusmus, burnt the camp which had been deserted by the enemy, and built a new one for his troops; and by means of a high wall which he constructed, equal to the whole breadth of the illusmus, that is, 25 statis, with towers and redoubts at proper distances, he lodged his forces in safety, and cut off all provisions from the besieged, thus producing a famine which soon after raged in the city. To deprive them more completely of necessary supplies, he attempted to leap up the mouth of the haven by a mole. This effort, however, was ineffectual; as the Carthaginians opened, on a sudden, a new outlet on the other side of the haven, and appeared at sea with a numerous fleet, which they had then built with the old materials found in their magazines. Having thus offered a kind of insult or bravado to the Romans, without immediately attacking their fleet, which it is said they ought to have done, they returned into the harbour. In a subsequent naval engagement, they were defeated. Scipio having made some further advances towards the distrefs and capture of the city, terminated this campaign.
campaign. During the winter-quarters, he endeavoured to overpower the enemy's troops without the city; and in his last action cut to pieces above 70,000 of the enemy, as well as their two and a half miles of a neighboring fort, called Neapolis, after following a siege of 12 years. The execution of this task was followed by the further advance of almost all the strongholds in Africa; and contributed very much to the taking of Carthage itself, into which, from that time, it was almost impossible to bring any provisions. Early in the spring, Scipio attacked, at one and the same time, the harbour called Calon, and the citadel. In the progress of this business a dreadful slaughter took place for six days; but on the 7th day, when it was expected the siege would have continued much longer, and much more blood have been shed, there appeared a company of men in a suppliant posture and habit, who declared no other conditions but that the Romans would please to spare the lives of all those who should be willing to leave the citadel. The request was granted to all, except the defectors; and, accordingly, 50,000 men and women came out. The defectors, about 40,000 in number, finding that they had no quarter to expect, fortified themselves in the temple of Astarte, with Afdrubal, his wife, and two children; where they might have held out a long time, though their number was small, as the temple stood on a very high eminence of rocks, to which the ascent was by 60 steps. But at length their patience was exhausted, and they abandoned the lower part of the temple, and retired to the uppermost story, resolving not to quit it but with their lives. Afdrubal came down privately to Scipio, and, being desirous of saving his life, threw himself at the feet of the Roman general; by whom he was exhibited to the defectors, who, transported with rage at the sight, poured out their imprecations against him, and set fire to the temple. While it was burning, we are told, that Afdrubal's wife, disregarding herself as splendidly as possible, and placing herself with her two children in flight of Scipio, addressed him with a loud voice:—"I call not down," says she, "curse upon thy head, O Roman; for thou only taketh the privilege allowed thee by the laws of war; but may the gods of Carthage, and thou, in concert with them, punishest, according to his deserts, the false wretch, who has betrayed his country, his gods, his wife, his children!" Then, directing herself to Afdrubal, "Perfidious wretch," says she, "thou bastafet of creatures! this fire will presently confound both me and my children; but as to thee (too shameless general of Carthage!) go—adorn the very triumph of thy conqueror—fiend, in the fight of all Rome, the tortures thou so justly deserve!" She had no sooner pronounced these words, but seizing her children, she cut their throats, threw them into the flames, and afterwards rushed into them herself, in which she was imitated by all the defectors.

Under the magnificence of this city, he shed tears over its fate; and reflecting that cities, nations, and empires, are liable to revolutions no less than individuals; that the like kind fate had befallen Troy, anciently so powerful; and, in later times, the Athenians, Medes, and Persians, whose dominions were once so extensive; and, lastly, the Macedonians, whose empire had been so glorious throughout the world; these mournful ideas suggested to him the following verses of Homer, which he repeated:—

"Ωκτεθνήκες Ὀμήρου, ἦς ὅδε ἐς ἀλήθειαν ἅλατον ἐς τῇ Καλλιφασκόλεον, ἐν ἀληθείᾳ ἔγραψεν."

I. 2. 164, 165.

"The day shall come, that great avenging day,
When Troy's proud glory in the dust shall fall,
When Priam's pow'rs and Priam's self shall fall,
And one prodigious ruin swallow all." Pind.
tary; down none, or only. _R._ flat, hairy; hairs longer than the seeds.

Eff. Ch. Outward calyx-scales with more than one spine, Lam.

Sp. 1. C. tinctorius, birked farron, or safflower, Lam. Sp. Pl. 1. Mart. 1. Wildl. 1. Gært. tab. 161. fig. 2. Lam. 18, Pl. 661. fig. 3. Carthamus officinarum, Tourne. Bauh. pin. "Leaves ovate, entire, ferrate-acutellate." Lam. "Stem perfectly smooth; leaves ovate, entire, spinous-toothed; seeds naked." Wildl. Root annual. Herb in shock in all its parts. Steem about two feet high, erect, cylindrical, woody, branched toward the summit. _Leaves_ simple, entire, acuminate, wined, with spinos at their edges; root-leaves oblong, narrowed at the base; stem-leaves small, ovate, half-emvbracing the stem. _Flowers_ rather larger, terminal, solitary; calyx-scales broad at the base, flat, reflecting the leaves; flowers of a fine farron colour. _Seed_ white, naked. A native of Egypt and the warmer parts of Asia. The seeds have a pungent quality, and are said to be particularly useful when the flesh is parched with a viscid viscid mucus. They are a favourite food of parrots, on whom they do not produce a similar effect. The flowers are supposed to have the same medicinal properties as farrons; but they are chiefly used as a material for dyeing silk and cotton stuffs, to which they give a beautiful, but fugitive rose-colour. A red pigment is likewise prepared from the flowers, used by painters, and known as a coum-

tic rouge by the Pariían ladies, under the name of vegetable rouge, Spanish vermillon, or lake of carthamus. C. _florousus_, Wildl. 2. (C. orientalis, Tourn. cor. 33.) "Stem perfectly smooth; leaves oblong, entire, spinous-toothed, seeds crowned with down." Wildl. Root annual. Stem erect, white, branched. _Leaves_ oblong, narrower than those of C. tinctorius, fimbriated, divided, toothed; teeth spinous; spines awl-shaped, yellowish, long. _Flowers_ yellow. A native of Armenia. C. _fronsis_, Willd. 4. Desfont. "Stem perfectly smooth; leaves lanceolate, entire, spinos-toothed; outer calyx-scales longer than the flower, spreading, spinous-toothed at the base." Root annual white. A native of Peru. 4. C. atus., Willd. 4. Vahl. syl. 1. tab. 17. Fo. vol. 217. (Cicinus atrac-
tylidiol folio, flore purpureascens, Tourne. Cor. 35.) *'Cicinus villosus, leaves prostrate, lanceolate, entire, spinos-toothed, inner calyx-scales somewhat rounded, obtuse at the summit, fe
totheed. A native of Africa Minor. 5. C. lanatus, yellow diUaff thistle, or wooly carthamus, Lam. 2. Mart. 2. Lam. 2. Wildl. 5. (Cicinus atrac 

tylidiol folio, flore purpureascens, Tourne. Cor. 45.) Atradeya lutea, Bauh. pin. 379. Atradeya fuscus agriditis, Gært. tab. 161. fig. 2. Claudio beni of the Peris-

ians.) "Stem hairy, woolly towards the top; lower leaves pinnatifid, upper ones embracing the flem, toothed." Lam. "Stem woolly; lower leaves pinnatifid, toothed; upper ones embracing the flem, pinnatifid, toothed." Wildl. Root annual. Stem about two feet high, upright, cylindri-

cal, branched towards the summit, cobwebbed between the branches. _Leaves_ oblong, spinous. _Flowers_ yellow, foli-

tary at the end of each branch, forming all together a kind of corymb; outer scales of the calyx foliaceous, reticulately

nerved, pinnatifid-spinous, very prickly; inner ones carbo-
lignious, appended, ciliate, ending in a sharp spine; rece-
ceptacle befit with bristle shaped chaff. _Seed_ inverly py-

ramidal; thole in the circumference differing a little in shape from those of the circumference. Lam. and Gaert. The leaves are rather bitter, and are sometimes used as a febrifuge and sudorific. A native of uncultivated ground and the borders of fields in the south of France, Spain, and Italy, where the women use its battle for dittails. C. _creticus_, Lam. 5. Mart. 3. Lam. 3. Wildl. 6. (Cicinus creticus flore leucophaeus, Tourne. Cor. 33.) "Stem nearly even; calyxes a little woolly; florets about nine; lower leaves lyrate; upper ones half-embracing the stem, toothed." Linn. "Stem even; calyxes nearly smooth; flowers white." Lam. Root annual. Stem near four feet high, very white. _Tourn. 451._ deeply indented, armed with strong spines. _Flowers_ few, white, and according to Haller with five black lines at the opening, which divide and make the edges of the segments black. Haller also affirms that the radical florets of this and the preceding species are stouter and abutives, whence Jut-

sen refers them both to his genus calastraps, formed from the centaurus of Linnaeus. Gathered by Tomnordt in the island of Cadora, who sent the seeds to the royal garden at Paris. 7. C. peltatus, Wildl. 7. Desf. Ath. tab. 232. "Stem villous; calyxes smooth; leaves petiunculate toothed, spinous; lower ones linear-lanceolate; upper ones ovate." Lam. Root perennial. _Leaves_ smooth. _Flowers_ in a cor-

ymb; calyx-scales spinous-ciliate on each fl.; and shapled and pungent at the summit. Desf. A native of uncultivated

mountains in Barbary. 8. C. m. multijihla, Wildl. 8. Desf. Ath. tab. 217. "Stem febrifuge; lower leaves pinnatifid; segments gaft-toothed, spinous; upper ones ovate-lanceolate, spinos-toothed." _Flowers_ in a corymb; calyx-

scales ciliate-spinous at the edges, ask-shaped at the tip. Desf. A native of uncultivated hills about Algiers. 9. C. tinctorius, Linn. 4. Mart. 4. Wildl. 9. (Cardium carules errectus, Moris. hist. tab. 33. fig. 19.) "Root leaves pinnat-

ic; stem leaves pinnatifid; stem one flowered." Linn. Root perennial. Stem a foot and half high, feldom branched. _Leaves_ narrow-spear-shaped, densely ferrared; each of the ferratures ending in a sharp point. _Flowers_ blue; scarcely different from the next species. Linn. A native of Barbary, about Tangier. 10. C. carules, Linn. 5. Mart. 5. Lam. 4. Wildl. 10. (Onobroma carules, Gært. tab. 162. fig. 7. Cincus carules affector, Bauh. pin. 578. Tourne. 451. Cn. alter, Chif. hist. 2. p. 152. Lob. ic. 2. p. 19.) "Leaves lanceolate, spinos-toothed; stem generally one-flowered." Linn. Root perennial. Stem single, purplish, hairy and channelled. _Leaves_ covered with a short, hairy down. _Flowers_ blue; outer calyx-scales broad, long, with sharp spines on their edges; inner ones narrow, terminated with a sharp yellow. A native of Spain and the coast of Barbary. Miller affirms that it is extremely different from the preceding: but La Maree observes, that though the tinctorius of Linnaeus may perhaps be a different species, Montio's cardium carules appears to him to be only a variety of the present. 11. C. bellii, Wildl. Desf. Ath. tab. 230. "Stem gen-

erally one-flowered; leaves ovate; lower ones quite entire; upper ones slightly toothed, not spinous." Root annual. _Leaves_ smooth, embracing the flem. _Flowers_ yellow; cal-


cy-scales ferrated, a little spinous. A native of corn fields in Barbary, near Mafcar. 12. C. fumatus, Wildl. 12. Desf. tab. 229. "Stem one-flowered; leaves pinnate; pinnate often trihls, spinous ferrated; inner calyx-scales fic
tious and toothed at the tip." Root perennial. _Flowers_ blue. A native of Barbary. 13. C. carduncellus, Linn. 7. Mart. 7. Lam. 5. Wildl. 14. (Cicinus carules hemisbia montis Lupi, Tourne. 451. Carduncellus, Moris. tab. 33. fig. 15.) "Stem-leaves linear, pinnate, the length of the plant." Linn. "Stems weak, one flowered; leaves long, scarcely spinous; root-leaves lyrate; stem-leaves pinnate; stem pinnate, deciduous." Lam. Root perennial. Stems several, about six inches high, simple, sometimes a little woolly. _Flowers_ blue, large, terminal: outer calyx-scales foliaceous, inner ones smooth, ciliate at their summit, and terminated by a small barious appendage; down of the seed capillary,
CARATHAMUS.

capillary, unequal, deciduous. A native of the south of France. 14. C. nitidiflorus, Lam. 6. Matt. 6. Willd. 13. (C. humilis, Lam. 6. 2.) " Leaves not spinous; root-leaves rounded; stem-leaves pinnate." Lam. " Generally bifid; leaves spreading on the ground; flower large." Lam. " Root perennial. Leaves long, spinous, deciduous, 6 inches high, smooth, slightly fertilized, with one or two leaves. Root-leaves, some lanceolate, dilated at the end, and very smooth, toothed from the middle to the side; teeth turned upward, sharp, ending in a small thorn; other spinous; pubescent, lanceolate, reflexed, quite entire, some of them curled at the base underneath. Stem leaves intermediately pinnatifid. Flower bright blue; calyx: base; outer scales foliaceous, concave, spine-shaped, obtuse, quite entire, laciniate, dilated, and generally dilute of conical veins or nerves; inner ones narrower, obtuse; minute, acuminate, dilated, and ciliated at the tip. Drown of the elder genus, Gumnium. A native of France. 15. C. arboriflorus, Lam. 9. Mart. 8. Lam. 7. Willd. 15. (Ceratocarpus arboreus, Tamm. 431.) " Leaves furred, flaped, garni-toothed." Lam. Root perennial. Whole plant pubescent. Stem six feet high, firm, evergreen: Leaves clasping the stem, green, veined, very spinous at their edges; lower ones near a foot long, rounded or pinnatifid, with spinous teeth. Flower most commonly solitary, yellow, of a pleasant smell; outer calyx-scales foliaceous, spinous; inner ones ciliated; down of the feed capillary. A native of Spain. 16. C. monilifera, Lam. 8. (Carduus marianus, Lam. Engl. Bot. 976. Crott. Lond. tab. 54. Silybum marianum, Gaert. tab. 162. fig. 2.) " Leaves furred, toothed, spinous, embracing the stem; calyx-leaves pinnatifid, spinous at the margin and tip." Lam. Root annual. Stem five or six feet high, branched, furnished, smooth. Leaves large, deep green, beautifully variegated with milk-white veins; root-leaves pinnatifid; stem-leaves alternate, recurved, oblong, acute, repand, generally smooth, ciliated at the edge with unequal spines. Flowers purple, terminal, solitary, large, on naked peduncles; calyx-scales very different from those of carduus, distinctly appendicled, armed with lateral and terminal spines. A native of road sides, &c. in England, France, and other parts of Europe. There is a variety not unfrequent in the neighborhood of London without variegated leaves. The common fort was held in great veneration by the physicians and botanists of the dark ages, having, as they imagined, derived its white veins from the milk of the Virgin Mary, which accidentally dropped upon it. Its root, leaves and seeds are feodoric, cooling, and diuretic. It has also been recommended as a pectoral, and is said to have been taken with effect in pleurisy. 17. C. corymbosus, Lam. 8. Mart. 10. Lam. 9. (Chamaecistus minor, Bawhr. p. 580. Dalech. hift. 1454. Lob. f. c. 2. p. 5. Carduus chamaeleon. Morit. tab. 33. fig. 17. Broteria corymbosa, Willd.) " Flowers in a corymb, numerous." Lam. Whole plant formidable spinous. Root perennial. Stem from six to nine inches high, upright, channelled, branching into a corymb at its summit. Root-leaves rather large, spreading on the ground, dark green, smooth, deeply divided; divisions pinnatifid, toothed, and spinous. Stem-leaves small, oblong, fleshy, armed at their edges with short, stiff, double spines. Flowers small, of a clear blue colour, (white, Miller,) forming with their branches a dense cluster at the ends of the branches; calyx oblong; scales armed with spines at their edges and summit. A native of the south of Italy, Romania, and Sardinia. It has the habit of echinops, and according to Willdenow, properly belongs to the order segregata, where he has placed it as a distinct genus next to echinops, but La Maree affirms that it has all the characters of calamus, and ought not to be so included from the other species of this genus. No author Gilmour, Willdenow has mentioned a proper ally to corymbosus. 18. C. nanus, Lam. 13. (C. acanthi, f. 2. Lam. 7. Mart. 5. Willd. 8. Chinese polyanthus, Linn.) " Leaves and flowers much smaller than ordinary. Each petal of Chinese flaminia bicolor, Choit. hift. p. 195. Lob. 8. 2. 1765. " Leaves, narrow lanceolate, decurrent; flowers small, white or yellow, with yellowish spines; calyx long, white; flower spinose, pinnate, pubescent near the tip." Lam. Root perennial. Stem four and half high, erect, winged, branching, forming a corymb at its summit. Leaves wheel-shaped. Flower purple, oblong or nearly oval, armed and dilated at the summit of the branches, terminated by bracts; fruits small; calyx woolly; seeds terminated by an appendix, armed with yellowish lateral and terminal spines. A native of Spain. and the south of France. 19. C. melanospermum, Lam. 14. " Leaves linear, quite entire, smooth; few herbaceous, one-flowered." Stem six or seven inches high, simple. Leaves smooth, without spinos; lower ones long, numerous, growing near together. Flower terminal, small, naked; outer calyx-leaves ovate, smooth, a little appendicled, with very short lateral spines. Found in the Straits of Magellan by Connexion. 20. C. sichierianus, Lam. Jun. Supp. p. 550. Mart. 9. Lam. 15. Willd. 16. " Stem thorny; petals spinous; leaves lanceolate, entire, downy and much prickly at the tip; branches one flowered." Bracteoes long, white, cottony. Leaves furred, nearly fleshy, smooth and veined above, clothed with a white cottony, or silky pubescent down underneath, terminated by a feathery spine. Flowers white, solitary, terminal, naked; calyx short; scales unattached, appended, white on the outside, bordered with spinous teeth, down of the feed feathery, on which account Ventenat is inclined to think it an atrachilis. A native of the island of Madeira. La Maree, Enye. vol. i. p. 639, 640, has removed atrachilis caneculata and gummiifera of Linnaeus to this genus; but his successor Boret has remanded them back again to their former station. See Enye. vol. vi. p. 29, 30, sub Quenouillat and Atrachilis of this dictionary.

Obf. Gartner makes naked seats an essential part of the generic character. His carthamus of course includes only the first species, all the others having their heads crowned with down; and even in that, the heads are said by Jussieu, Ventenat, and du Tour, not to be naturally naked, though the down, being extremely caducous, has escaped the notice of most authors.

Propagation and Culture.—The first species has been cultivated in Egypt from the earliest ages for the use of dyers. From 16 to 12,000 hundred weight of flowers is the present average annual produce; seven eighths of which are exported to Europe; the rest is consumed in the country and other parts. It was not known in Italy in the time of the elder Pliny, but it is said by Allon to be now found apparently wild, or at least perfectly naturalized in the neighbourhood of Nice. It is cultivated with success on some parts of Germany, where its feeds come in copious quantity, and was introduced into England, as appears from Turner's herbal, as early as 1574. In the year 1683, twenty-five acres in the vale of Exeham, in Gloucestershire, were sowed with its seed, and the produce was such as might have justified a farther trial. No attempt of the kind, however, has since been made; and there is perhaps reason to apprehend that in our variable climate, and with our frequent wet summers, the crop would always be uncertain; for the quality of the flowers is considerably impaired if they are exposed to rain in the interval between their open-
ing and being gathered for use. In Germany it is found in the lightest land, which has always a double fallow given to it, first to destroy the weeds, and afterwards to make it fine. After it has been followed a summer and a winter, and has been ploughed and harrowed four times, it receives its last ploughing and harrowing in the latter end of March. The seeds are then scattered thinly in drills, made with a small plough, about a foot and half from each other, and the earth is drawn into them with a harrow, whose teeth are little more than an inch long; a roller is finally drawn over the ground to smooth and to settle it. After the plants are come up they are hoed three times, about five or six weeks between each time; and as soon as the flowers begin to open, the field is gone over once a week to gather such as are ready. There is usually a succession of flowers for five or six weeks; but great care should be taken that there be no dew upon them when they are gathered. They are immediately dried in a kiln, and may then be pressed close without fear of detriment. In Spain this plant is cultivated in their gardens, as marigolds are in England, to give a colour to their fields, olives, and other vines. Considered merely as an ornament, it is worthy of a place in the borders of our large gardens, as it continues in flower eight or ten weeks. The seeds should be sown about the beginning of April, in the ground where the plants are intended to remain, for the roots are injured by transplanting. Most of the other species will stand our winter in the open ground, but several of them will scarcely ripen their seeds; such of them as are perennial may, however, be readily increased by parting the roots. See Saltwort.


CARTHARA, in Ancient Geography, a town of Mero- potamia.

CARTHEUSER, John Frederic, in Biography, professor of medicine at Frankfort on the Oder, acquired considerable reputation about the middle of the last century, by several very luminous works on the subjects of botany and pharmacy. The principal of these are "Rudimenta Matrice medicæ rationalis," Francof. Svo. 1741, reprinted in 1749, much enlarged and improved, in two volumes Svo. Besides describing the simples, and the method of preparing and compounding them, the author has given the refult of his own experience of their virtues. "De Generica quibusdam Plan- tarum Principiis, haecorum plurimum negleoticis," Francof. 1754, 8vo. A valuable work. Haller says, in which the author introduces several articles not before found in similar publications, particularly of the trees producing wax, a substance like butter, and a kind of fuel. The trees are natives of China. Besides the above, there is a variety of differtations, mostly on interesting subjects. The titles, with short accounts of them, are given in Haller's Bib. Botan. See also Eloy. Dict. Hill.

His two sons, Frederic Augustus, and William, became also doctors in medicine, under the auspices of their father. The importance of the works left by them are," "Elementa Mineralogiae syltematica digesta." "Francof. 1755, 8vo, by the elder; and "Differtations phylico-chemico-medicae; de quibusdam materic medicæ subjunctis," Svo. 1774; and "Differtations nonsoluta; feleciors, phy. chem." Svo. 1775, including some written by the father, and by other writers.

CARTHUSIANS, in Ecclesiastical History, a branch of the BENEDICTINS, an order of religion, instituted by St. Bruno, about the year 1084 (some fix at 1080, and others in 1085), remarkable for the austerity of their rule, which obliges them to a perpetual solitude; a total abstinence from flesh even at the peril of their lives; and to feed on bread, water, and salt, one day in every week; and absolute silence, except at certain stated times.

Their houses were usually built in deferts, their fare coarse, and their discipline severe. It is observed, that the monas- tical piety is still better preferred in this, than in any of the other orders. M. l'Abbé de la Trappe, however, endeavours to shew, that the Chartusians do not live up to the austerity enjoined by the ancient statutes of Guigues, their fifth general. M. Maffon, general of the order, answers the abbé; and shews that what he calls the statutes, or constitutions of Guigues, are, in real ly, only customs compiled by father Guigues; and that they did not become laws till long after.

The word is formed from Carolus, or Cartusius, a denomination given them in Latin, from a village in Dauphiné called Chartreux, in Latin Cartusium, Charteretus, as foue say, where the first monastery of this kind was erected. Hence the French call the religious of this order Chartreux, and their convents Chartreuxes; an appellation which also appears to have anciently obtained in England; whence the name of that celebrated hospital, or rather college, in London, the Charter-house; by corruption from Chartreux.

The Chartusian habit is all white within, their sepulchral being joined in the sides by two pieces of the same stuff. They wore a hair shirt next their skin. Their prior and procurator, who may go abroad upon the necessary affairs of the house, appear in a black cloak down to the ground, and a black hood over the white one; the hood not round, but tapering to a point.

There are few nunns of this order. There have, however, been some female Chartusian convents; but the increase of them was prohibited in 1568; so that there remained only five, four in France, and one at Bruges in Flanders. As the rigorous discipline of the Chartusians is altogether incon-istent with the tenderness and delicacy of the female sex, the austerity of the order has been diminished in the female con- vents; and it was more particularly found necessary to ab-rogate those severe injunctions of silence and solitude, that are so little adapted to the known character and genius of the fex. They were brought into England by Henry II. about the year 1180, and had only nine nuns; their first house being at Witham in Somersétshire.

Carthuser powder, poudre des Chartreux. See Kernes mineral.

CARTIER, or QUARTIER, James, in Biography, an eminent navigator, was born at St. Malo's, where he distinguished himself as a skilful pilot. Francis I. employed him to prosecute discoveries in Canada, for which purpose he made a voyage thither in 1534, examined the country with great attention, and gave an exact description of all its islands, coasts, capes, bays, &c. which was of great use to subsequent navigators.

Cartilage, in Anatomy, is a semipellucid substance, of a milky-white or pearly colour, entering into the composition of several parts of the body. It holds a middle rank in point of firmness, between bones, or hard parts, and the softer constituents of the human frame. It appears, on a superficial examination, to be homogeneous in its texture; for, when cut, the surface is uniform, and contains no visible cells, cavities, or pores, but resembles the fection of a piece of glue. The cartilages of the ribs, however, particularly in adults, present a kind of fibrous appearance in its texture: and Dr. Hunter has discovered, by microscopic examination, that the cartilaginous crists of articular surfaces are composed of straight parallel fibres directed towards the cavity
C A R

cavity of the joint. (Philos. Transact. N° 470.) This sub-
flance pouldists a very high degree of elasticity; which pro-
perly distinguishes it from all other parts of the body.
Hence it enters into the composition of parts, whose func-
tions require the combination of firmness, with pliancy and
flexibility: the prevention of sliding and external form, with
the power of yielding to external force or pressure.

Cartilages are covered by a membrane, resembling in tex-
ture and appearance, as well as in its office, the periodien-
or of bones; this is termed the perichondrium. They receive
arteries and veins from this membrane: these vessels, how-
ever, have never been demonstrated in the cartilaginous
crusts of articular surfaces. Absorbed vessels cannot be
actually shown: but their existence is abundantly proved by
many phenomena. The conversion of cartilage into bone
is alone sufficient for this purpose. The cartilaginous sub-
flance is gradually removed as the formation of the bone
advances. In affections of the joints their cartilaginous cov-
erings are often both entirely destroyed, or partially re-
 moved; which appearance can only be ascribed to the action
of absorbent vessels. It does not seem to pouldea nerves,
as it is entirely deficient of sensibility.

Its colour is not affected by feeding an animal with madder.

It refuits the effects of preflure from contiguous diseæase,
longer than the bones, or the soft parts of the body. Dr.
Hunter has observed in the cartilages of the ribs; and the
fame fact is also witnified in the bone in the cafe of amenorrœ in the defending sort.

It does not exfoliate like the substance of bones.

When destroyed, it is never reproduced. We have ob-
served a curious exemplification of this fact in the case of
unhealed joint; in which the head of the disintegrated bone has its
cartilaginous crust gradually worn away by friction against
the surrounding parts; this is never replaced; but the sub-
flance of the bone itself becomes highly polished. The new
cavity, which is ultimately formed for it in the bone, on
which it lies, has no cartilaginous surface, but is polished
in the fame way.

The thinner cartilages of the body are resolved by macera-
rion into a kind of fibrous subflance: e. g. those of the
organs of sense. These are the softest, and most flexible in
the body. Thoese of the ribs, if boiled or macerated for
some months, seem to consist of oval laminae, surrounding
each other concentrically, and connected by transverse fibres.
These are much more dense and elastic. The intervertebral
and interarticulate cartilages, with that of the symphyses
pubis, obviously contain a considerable intermixture of tendi-
nous fibres; and may be resolved into a cellular tex-
ture.

Digestion, in a cloac vessel, dissolves cartilages, and con-
verts it into a jelly.

The cartilages of the body are divided, by anatomists,
to two kinds: the temporary and the permanent. The
former are confined to the earlier stages of existence; the
latter commonly retain their cartilaginous structure through-
out every period of life. The temporary cartilages are thoese
in which the bones of the body are formed. They are
here called by Latin writers Osteochrtes. All the bones
in the body, except the teeth, are formed in a nidus of car-
tilage. The form of the bone, with its various proceces, is
accurately represented in these cartilaginous primordia; and
it is the sublinace alone which changes. In the early peri-
ods of fetal existence, these cartilages are of a soft and
gelatinous texture; they become firmer and harder as the
growth of the subject advances. No difference is observed
in the cartilage, whether a long or a broad bone is to be
formed in it; whether the future bone be of the reticulated
or compact structure. As the cellular matter is depoited,
the cartilaginous subflance is absorbed. The cartilages
are thus connected to the body of the bone by cartilaginous
crusts, after they are completely ossified; but this part
is ultimately comphnoluted.

The permanent cartilages are of various kinds. The ex-
ternal ear, the external aperture of the eyeballs, and the
cylids, are composed of a thin and flexible cartilage, enclosed
in a duplication of the common integuments. See Ety,
EAR, and Nose.

The larynx is entirely composed of this subflance, and
the traæha, with its branches, is furnished with pieces of
cartilage, by which these tubes are kept permanently open,
for the ready passage of air to and from the lungs. See La-
rynvs and Trachea.

Portions of a dense and elastic cartilage are annexed to
the anterior extremities of the ribs; and in the seven first ribs
are articulated to the side of the sternum. The elasticity
of these parts constitutes a chief instrument of respiration, by
reforin the ribs to their former position when the action
of the intercostal muscles has ceased.

Contiguous bones are sometimes united by the interven-
tion of cartilage: as the two ossa pubis, the sacrum and
ossa innominata, and the two bones of the sternum. This
species of junction is technically termed synchondrosis.

The bodies of the vertebœ are joined by large masses of
a peculiar subflance, partaking of the properties and ap-
ppearance of cartilage and ligament; which allow of the
motions of these parts on each other, without weakening
the support which is afforded to the upper parts of the
body in general, and to the head in particular, by the ver-
tebreal column. These cartilages impart a great elasticity to
the spine, by which the effect of concussion, from jumping,
from falls, &c. are weakened, and destroyed, before
they can be propagated to the head. When the body has
been long in an erect position, the comprefion of these car-
tilages by the weight of the upper parts of the body, dis-
nipishes the height of the person. They recover their for-
mer length, when freed from the preflure of the superci-
cumubant parts. Hence a person is taller when he ripes in a
morning, than after suffusing the fatigue of the day; and
the difference has sometimes amounted to an inch. (Philo-
osophical Transactions, N° 383. Hist. de l'Acad. des
Sciences, an. 1725.)

Cartilages are sometimes interposed between the articular
surfaces of bones; where they fill up irregularities, that
might otherwise impede the motions of the part; and in-
crease the security of the joint, by adapting the articular
surfaces to each other. Influences of this are found in the
articulation of the lower jaw; in the connection of the
clavicle with the sternum, and in the knee-joint. These are
called interarticular cartilages.

The articular surfaces of bones are in every instance cov-
ered by a thin crust of cartilage, having its surface most
exquisitely polished, by which all friction in the motions
of the joint is avoided, and the ends of the bones glide over
each other with the most perfect facility.

These permanent cartilages become not unfrequently
more or less ossified in old persons. The cartilages of the
larynx, particularly the thyroid and cricoid, and those of
the ribs, are generally affected in this way in an advanced
age; yet some instances have been observed, where this
change had not taken place, even in very old subjects, as, e. g.
in the case of Thomas Parr, who was examined by Harvey,
(See Thoms Parre, Lond. 1669, Svo.) and of another per-
son of 130 years old by Keill. (Phil. Trans. N° 366.) The
symphyses
favour to the formation of the French. The fishes of this tribe are distinguished by having, as their name implies, a cartilaginous instead of bony skeleton.

The cartilaginous fishes are numerous, embracing the whole of the two last orders of ichthyology, the Branchio-
fidae, and Chondropterygii, in which the following genera are contained, Mustelus, Otobranch, Petromyzon, Diadromus, Sphy-
nathus, Pegasus, Centriscus, Boidae, Cyclopterus, Lophius, Aetipendel, Chimera, Squalus, Raja, Petromyzon, and Gla-
trobranchus.

Linnaeus separated the cartilaginous from the other fishes, and placed them in the class Amphibia, where they constituted the order Nantes. This division was made under the supposition that the cartilaginous fishes were, being both with lungs and gills, an idea apparently confirmed by the observations of Dr. Garden of South Carolina, who at the desire of Linnaeus examined the organs of the genus Diadromus, and found, as he conceived, both external gills, and internal lungs. These supposed lungs, however, have been since ascertained by naturalists to be only a peculiar modification of the gills, and it therefore now appears that this cartilaginous tribe are, in reality, fishes, differing principally, if not entirely, from other fishes in having, as before mentioned, a cartilaginous skeleton. They differ from the generality of other fishes, in having the gills delitute of bony rays, or in the gills being cartilaginous; and they are deficient, for the most part, at least, of obvious scales, those being either very judicious, minute, or so deeply imbeded in the skin as to be scarcely visible: in many of the cartilaginous fishes there is not even the slightest appearance of scales on the surface of the skin. See Fishes and Ich-
thyology.

Cartilaginous leaf, among Betonyla. See Leaf.

CARTILI, in Ancient Geography, a bay of Africa, where vessels sheltered themselves from the easterly wind; situate N.E. of the mouth of the river Chialalpul.

CARLISLE, a place of Africa, in Mauritania Caffari-
enis, between Cartagen and the colony of Caesarea, ac-
cording to the Itinerary of Antonine.

CARTINAGA, a town of India, on this side of the Gauges. Ptolemy.

CARTISMANDUA, in Biography, queen of the Bri-
gantes in Britain about the middle of the first century, justly incurred infamy by causing Caractacus, who had put him-
self under her protection with promises of safety, to be ar-
rested and delivered up to the Romans, A.D. 49. By this act of treachery, she gained their favour and increased her
own power and wealth. But afterwards, preferring to her husband Venonus, who was celebrated the bold warrior among the Britons (Caractacus excepted), her country Vallicatanus, and advancing him to the partnership of her throne and bed, she occasioned two contending parties; one in favour of Venenus, which maintained his right to the throne, and another which adhered to the interest of Cartismandua. When she found herself likely to be overpowered, she sought the protection and alliance of the Romans, who secured her safety, and in the issue of the contest made themselves masters of the country. Tacitus, Annal xii. Hist. iii.

CARTMEL, in Geography, is a market town of Lancas-
shire, England, leated in a woody vale, near a tract of sands which run out into the Irish Sea. These sands bear the respective names of three rivers, which here discharge them-
elves into the ocean. To shorten the distance from one place to another many persons travel across these sands, but from the danger that attends these pathless roads, it is found necessary for strangers to employ guides, who are confidently waiting for that purpose. These are employed, and paid, by the government. In the vicinity of the town are some high hills, known by the name of Cartmel Fells. Here was formerly a priory, which was founded by William Minshull, earl of Pembroke, in the year 1188, for canons regular of the order of St. Austin. The church, which originally belonged to this religious foundation, is appropriated to the parish, and is a large handsome structure. Its tower is very peculiar, being square for some distance from the ground, and the upper part fat diagonally within the lower. The interior of the church is fitted up in a very neat style, and contains a number of fine and ancient monuments. The parish has five chapels of ease, at small places in the vicinity of the town. Here is a free grammar school well endowed, and its buildings were erected in 1795. Though Cartmel has no particular manufactories, yet in its vicinity are three very large cotton-mills. Here are two weekly markets, Tuesdays and Saturdays; and two annual fairs. Cartmel is 16 miles from Lancaster, and 265 N.W. from London. It contains 140 houses and 852 inhabitants.

About three miles south of the town are Cartmel Wells, which are reported to in the summer season, and their waters are found serviceable in the combative complaints. A pleasant walk through the woods of about a mile leads to Villa-
Hall, the seat of Lord George A. Cavendish. The mansion is ornamented with several fine pictures by Vandyke, and other artists.

CARTON, or, as we pronounce it, Cartou, in Paint-
ing, a design made on ivory paper, to be afterwards car-
qued through, and transferred on the fresh plaster of a wall, to be painted in fresco.

Carton is also used for a design coloured, for working in mosaic, tapestry, &c. The word, in the original French, signifies thick paper or paste-board.

In Italian, whence the term seems to be derived, cartoune, or cartoni, signifying large paper, denotes several sheets of paper pasted on canvas, on which large designs are made, whether coloured or with chalks only. Of these cartoons there are many by Domenichino, Lionardo da Vinci, Andrea Mantegna, Michael Angelo, &c; but the most celebrated performances of this kind are the "cartoons of Raphael" or Raffaello Sanzio, Da Urbino, which are seven in number, and form only a small part of the sacred historical designs executed by this famous artist, while en-
gaged in the chambers of the Vatican under the auspices of pope Julius II. and Leo X. As soon as they were finished, they were sent to Flanders, to be copied in tapestry, for adorning the pontifical apartments; but the tapestries were not conveyed to Rome till after the decease of Raphael, and probably not before the dreadful sack of that city in 1527, under the pontificate of Clement VII.; when Raphael's followers having fled from thence, none were left to inquire after the original cartoons, which lay neglected in the store-
rooms of the manufactury. The revelation that happened soon after in the Low Countries prevented their being no-
ticed during a period in which works of art were wholly neglected. The few, however, escaped the wreck of the
others, which were torn in pieces, and of which some frag-
ments
ments remain in different collections. These were purchased by Rubens for Charles 1., but they had been much injured by the weavers. In this state they are fortunately escaped being sold in the royal collection, by the disproportionate appretiation of their seven at 300; and the nine pieces, which were the triumph of Julius Caesar by Andrea Mantegna, appraised at 1050. The cartoons seem to have been little noticed till King William III. built a gallery for the purpose of receiving them at Hampton-Court. After having suffered much from the damp of the situation in which they were placed, they were removed by order of his present majesty king George III. to the queen's palace at Buckingham-house, and thence to the castle at Windsor, where they are open to public inspection. These cartoons are justly represented as 'the glory of England, and the envy of all other polite nations;' and his majesty is entitled to a tribute of respect and applause for his care in preserving these precious treasures. They have been long deferredly held in high estimation throughout Europe by all authors of refined taste, and by all the admirers of the art of design, for their various and matchless merit, particularly with regard to the invention, and to the noble expression of such a variety of characters, counoetenues, and attitudes, as they are differently affected and suitably engaged, in every composition. The Abbé du Bos, in his treatise on poetry and painting, has committed a very gross error in his development of one of the characters in this collection. Having described the carton of the miraculous draught of fishes, he points out with propriety the expression of St. Peter, St. John, and other disciples, and then proceeds to illustrate a singular character, which he seems particularly to admire, for the strength and justness of the expression; that figure, according to his opinion, being represented with a confounded countenance, and melancholy complexion, and seeming to be devoured by black jealousy, in which person (he says) it is easy to distinguish Judas. Whereas if this ingenious writer had maturely considered the time which Raphael chose for his subject, and which was, as the evangelist informs us, the third time of our lord's appearing to his disciples after his resurrection, and consequently some weeks before the death of Judas, who hanged himself, then Christ was condemned; or if he had counted the number of figures in the composition, which is only eleven and our Lord himself, he could never have committed so unaccountable an error, as to imagine that Raphael deferred commendation for being so absurd as to introduce so infamous a wretch, at such a point of time, when Christ was directing his disciples to take care of his flock; or for grouping such a person among the apostles, who, as he was dead before, could not associate with them, and whom they would have avoided, if he had been alive, with abhorrence and detestation. The discernment and judgment of Raphael could not have allowed him to be guilty of so gross an anachronism. "Perhaps the best apology, and the truest (says Pilkington), that can be made for this mistake of Du Bos, is, that he was much more conversant and better accustomed with the works of Raphael than with the works of the Evangelist. Mr. Fuseli, however, remarks, that Mr. Pilkington has miscalculated the number of the cartoons; as he mentions that which represents the miraculous draught of fishes, and the subsequent one of the donation of the keys, with regard to which Du Bos committed his error, as if they were the same. Pilkington's Dictionary of Painters by Fuseli, art. Raffello Sanzio, Du Erino.

CAR TOUGH, in Architecture, Sculpture, &c. denotes an ornament representing a scroll of paper; being usually in form of a table; or flat member, with wavings; wherein is some inscription, or device, ornament of arms, cyphers, or the like. It is nearly akin to a medallion; from which it only differs in this, that the latter is used under the cornice in the eaves of a house, and the former in window-cutting within doors. Some workmen call the cartouches dentici. The word is French, forced from the Italian cartoccio, which signifies the same. Cartouches are sometimes drawn on paper, as in the titles of maps, &c., and are sometimes made of stone, bricks, plaster, wood, &c. for buildings.

Cartouches, in Heraldry, a name given to a sort of oval shields, much used by the papal and secular princes in Italy, and others, both clergy and laity, for painting or engraving their arms on. Many suppose this form decorative to the honour of the person; but though the square shield, with the roundend and pointed bottom, is more to be liked with us, it is also with the French and Germans; yet this is supposed more truly the figure of the Roman shield worn by the soldiers, and therefore more ancient and honourable than either that or the indicated shield of the Germans.

Cartouch, in the Military Art, a wooden case about three inches thick at bottom, and gilt round with marine, holding two, three, or four hundred musquet balls, with eight or ten iron balls weighing one pound each, to be fired from a mortar, gun, or howitzer, for the defence of a pass, defile, ditch, breach, retrenchment, &c. It ought not to be confounded with the gargouge, gargouche, or gargouff, which is simply the case or roll of paper, palte-board, parchment, or flannel, &c. filled with the charge of powder necessary for the caliber or bore of the piece or fire arm made use of; whereas the cartouch contains, besides the powder, balls of lead, old nails, chains, pieces of iron, &c. &c., which are put into the piece instead of a bullet, whether on a breach or on a retrenchment, in defending a pass, or against an enemy near to you in battle. Thoie, who make use of this fort of firing, are said to fire with the cartouch, in French tirer a cartouche.

Cartouches, in Artillery, are made of leather for slinging over the shoulders of the matrofes; who carry in them the ammunition from the magazines or wagons for the pieces of the artillery, when they are either at exercise or on actual service.

Cartouch de congé absolue, known under the name of congé d'ancienneté, or leave of seniority, is a sort form of absolute, final, or unlimited leave of absence from military service, inured on a sheet of paper called or known by the name of cartouche, on which are expressed the merits or defects of the military person, to whom the discharge or congé absolue is granted, whether for having finished the time or number of years he was engaged to serve by his contract of enrollment, that on account of the impossibility of his finishing the fame through his wounds or infirmities, or for other reasons, that exempt him definitively from service.

Cartouch de soldat, cartouchier, a cartridge-box, pochon, cartouch. It is a case of light wood covered with leather, with a flap over it of the floutelled blackened calf-skin, sufficiently thick and substantial to bear the wettest and severest weather. The case is considerably longer than broad, and has two rows of holes in it for about 44 musquet-cartridges. As it hangs from a buff cross-belt over the left shoulder, and is worn in that manner by the infantry, before the body of the soldier a little below the right pocket-hole for the purpose of carrying his ammunition, it is made of a form somewhat rounded or circular in order to apply equally every where to his body. It is worn by him in this way upon a belt both on ordinary duty and in the time of action. The flap is generally ornamented with a bras crown, &c.
for the battalion-men; a fuse for the grenadiers; and a single-horn for the light infantry. The pouches or cartridge-boxes used by the cavalry are smaller than those made of wood by the infantry. Cartridge-boxes have often been made of iron, but seldom or ever are now.

**CARTRIDGE**, in French *garogne*, *garouque*, or *garoufle*, and sometimes, but erroneously, *carrouche*, which signifies not merely the cartridge and charge of powder as the word *garogne*, *garouque*, or *garoufle* does, but the whole charge, consisting of the cartridge and charge of powder with the bullet, grape-shot, grape-shot, chain-shot, double-headed shot, balls, pieces of brass or iron, or whatever else is discharged from the piece by the inflammation of the powder. A cartridge, in the ordinary accoutrement of the soldier, is a case or cover holding exactly the charge of powder allotted for any piece, and so fitting the bore of the same as to be rammed home without difficulty. Cartridges have been made of various substances, such as paper, palte-board, parchment, bladders, and flannel. The bottoms of paper-cartridges are apt to remain in the fire-arm or piece, and to accumulate to such a degree as to prevent the priming from reaching the powder, besides which inconvenience they are attended also with others. Palte-board-cartridges are liable to nearly the same objections. The fire kindles up those made of parchment or bladders in such a manner, that they enter into the vent and become so hot, that the priming iron cannot sufficiently clear it. Nothing has as yet been found to answer better for cartridges than flannel, which is now generally made of for artillery-ones of all forts, because as it does not keep or retain fire it is not apt to occasion accidents in loading, which the others frequently used to do. But as the dust of powder paffes through them, parchment covers are sometimes made and put over them, which are taken off as they are used. Fanned carriages, however, may be rendered much more commodious or manageable, and not only a great deal fliuffer but also proof against the dust of powder penetrating or passing through them, by boiling the flannel, of which they are made, in fat. Without some such precaution to stiffen them, they are so pliable, and when large contain so much powder, that it is with difficulty they are put into the pieces. The loading and firing of guns with cartridges are much quicker and less liable to accidents than with loose powder.

The cartridge for a heavy brafs 42 pounder, or an iron 42 pounder for service, used to contain, and does now, 1 lb. of powder; that for a heavy brafs 32 pounder used to contain, and does now, 10 lb. 11 oz. of powder; that for an iron 32 pounder used to contain 9 lb. 4 oz. but contains now 10 lb. 11 oz. of powder; that for a heavy brafs 24 pounder or iron 24 pounder used to contain, and does now, 5 lb. of powder; that for a heavy brafs 18 pounder used to contain, and does now, 6 lb. of powder; that for an iron 18 pounder used to contain 6 lb. but contains now 6 lb. of powder; that for a heavy brafs 12 pounder or an iron 12 pounder used to contain, and does now, 4 lb. of powder; that for a heavy brafs 9 pounder used to contain 3 lb. of powder, and that for an iron 9 pounder now contains the same weight of powder: that for a heavy brafs 6 pounder used to contain 2 lb. 8 oz. of powder, but now contains only 2 lb. of powder; that for an iron 6 pounder used to contain 2 lb. 8 oz. of powder, but now contains only 2 lb. of powder; that for a heavy brafs 3 pounder or for an iron 3 pounder used to contain, and does now, 1 lb. of powder; that for a medium brafs 24 pounder used to contain, and does now, 6 lb. of powder; that for a medium brafs 12 pounder used to contain, and does now, 3 lb. 8 oz. of powder; that for a medium brafs 6 pounder used to contain, and does now, 2 lb. of powder; that for a medium brafs 3 pounder used to contain the same weight of powder as one for a heavy brafs 3 pounder, viz. 1 lb. of powder; and one for a brafs 3 pounder, according to general Defaghiers' construction, contains the same charge of powder now; that for a light brafs 24 pounder used to contain, and does now, 5 lb. of powder; that for a light brafs 12 pounder used to contain, and does now, 3 lb. of powder; that for a light brafs 6 pounder used to contain, and does now, 1 lb. 8 oz. of powder; and that for a light brafs 3 pounder used to contain 1 lb. 8 oz. of powder, but contains now only 8 oz. There ought not strictly speaking, to be fixed or determine charges for guns of different calibres. But they should vary as to the weights and quantities of the powder with the services, to which the guns themselves are to be applied. And it may with truth be admitted, that the charges of powder usually allotted for canons are generally greater than what are either proper or necessary for them on any service whatsoever. The ball charges even for one and the same piece, when applied to different uses or services, have never as yet been correctly ascertained, or even nearly so.

**Ball-cartridges**, in French *cartouches*. For the convenience of quick firing, the shot is fixed to the cartridge by means of a wooden bottom so hollowed or cut into on one side as to receive nearly one half of the shot, which is fastened to it by two small flaps of tin, which pass or cross over the shot and are fastened to the bottom, to the other side of which the cartridge holding the charge of powder is tied.

The cartridges are likewise fixed in the same manner to the bottoms of grape shot, which are used with field pieces, and are called in French *cartouches a grapes de rafin*.

**Cartridge-box.** See *Cartouches de pliat*. **CARTWRIGHT, Thomas,** in Biography, a learned Puritan divine, was born in Hertfordshire about the year 1575, and admitted into St. John's college in the university of Cambridge in 1590. Such was the affability of his application, commenced at college and continued through life, that he allowed himself only five hours of sleep. Upon the death of king Edward VI., he quitted the university, and became clerk to a councelor at law; but in this situation he prosecuted his former studies with unremitting diligence, at every interval of leisure which occurred. Being afterwards recommended by the gentleman who employed him to Dr. Pilkington, master of St. John's college in Cambridge, he was restored upon giving satisfactory evidence of his abilities and attainments, to that seminary of learning, and in 1560 was chorister fellow of his college. From hence he was removed to Trinity college, and on account of his peculiar merit, made one of the eight senior fellows. When queen Elizabeth visited the university in 1564, Mr. Cartwright was much distinguished; and in 1570 he was chosen lady Margaret's divinity professor. At this time his popularity as a preacher was so great, that when it was his turn to officiate at St. Mary's church, it was necessary to take down the windows for the accommodation of the multitude that attended him. The sentiments concerning church discipline, which he delivered in his lectures, were unfavourable to the established hierarchy, and complaints were preferred against him to sir William Cecil, chancellor of the university, both by archbishop Grindal and Dr. Whitgift, who defined that he and his adherents might be silenced. The chancellor, to whom Cartwright wrote in his own defence, seemed disposed to treat him with moderation; but his adherents renewed their accusations; and he was cited before the vice chancellor, to give an account of the obnoxious sentiments delivered in his lectures. Incapable of giving satisfaction, he was suspended from his office as a lecturer, and prevented
prevented from obtaining his doctor's degree. In 1571, Dr. Whiget was appointed vice-chancellor; and by his influence Mr. Cartwright was first deprived of his Margaret-professorship, and afterwards of his fellowship. As danger was apprehended from the differentiation of his principles in the university, he was constrained to leave it and of returning to his native country. While he was abroad, he formed an acquaintance with the most celebrated divines in several Protestant universities, who treated him with great respect on account of his learning and character, and he was chosen minister to the English merchants that resided at Antwerp, and afterwards at Middleburg, where he continued two years. His friends in England, however, were anxious for his return to his own country, and he at length yielded to their importunity. Upon his return he found that the prosecution against the Puritans continued with unabated violence; and though the authors of a piece in their favour, entitled "An Admonition to the Parliament," had been committed to Newgate in 1572, Mr. Cartwright wrote "A Second Admonition to the Parliament," which involved him in a controversy with Dr. Whitgift, that obliged him to leave the kingdom, while it was the means of advancing his opponent to the bishopric of Worcester. During an absence from his country of five years, he officiated in some of the English factories; and in 1580, James VI., king of Scotland, having an high opinion of his abilities, and learning, offered him a professorship in the university of St. Andrew's, which he thought proper to decline. Upon his return to England, he was arrested as a promoter of sedition, and thrown into prison; but being liberated by the intercessing of the lord treasurer Burleigh, and the earl of Leicesters, the latter conferred upon him the post of master of the Hospital, which he had founded in Warwick. In compliance with the solicitations of several learned friends at home and abroad, he undertook to write against the Rhenish translation of the New Testament; but some time after he had commenced the work, archbishop Whitgift, by an arbitrary and unjust mandate, prohibited his prosecution of it; the performance, however, was nearly completed; and was published some years after his death. In 1583 some new complaint was alleged against him, and he was committed to prison by Dr. Aylmer, bishop of London; and again in 1591, the same prelate ordered him to be lodged in the Fleet, where he was kept in a very close and rigorous confinement. Many applications were made on his behalf, but they were ineffectual till about the middle of the year 1592, when he was released, referred to his master of the hospital at Warwick, and permitted to preach. 'Towards the close of his life, the zeal with which he had, in the earlier period of it, opposed the church, was somewhat abated, and he seems to have lived on terms of friendship with archbishop Whitgift, who used him kindly and tolerated his preaching at Warwick. Long confinement and application to study had much impaired his health; and at length terminated his life in December, 1603, in his 68th year. In his private character, he was pious, disinterested, and charitable; and though the persecution against him was hard and severe, it originated with that contempt for superiority, which the intolerant principles of each party would lead them to abuse, and therefore demands some kind of apology from the censure of more enlightened and liberal times. Besides the works already mentioned, Cartwright wrote "Commentaria practica in totam Historiam evangeli- cam," 4to. 1639; reprinted at Amsterdam in 1647; "Commentarii succeincti et dulciadi in Proverbia Salomonis," 4to. Amst. 1638; "Metaphrasia et Homiliae in librum Salomonia, qui inscribitur Ecclesiastes," 4to. Amst. 1647; "A Directory of Church-government," 4to. 1644; and "A Body of Divinity," 4to. Lond. 1666. Biog. Brit. CARWRIGHT, William, a poet and divine of the 17th century, was born in 1601 at Northawe, near Tewksbury, in Gloucestershire, educated at Westminster school, and elected a student of Christ-church in Oxford, in 1628. Having gone through the course of studies, he took orders, and became, as Anthony Wood expresses it, "a mild and scholastic preacher" in the university; where he performed the office of junior proctor, and also that of metaphysical reader. His poetical productions amanised him in the course of these greater studies; and procured for him unbounded applause. But a malignant fever closed his career in his 33d year, December 1653. The king and queen, being at this time in Oxford, testified their respect for him, by their inquiries during his illness, and his majesty wore black on the day of his funeral. Mr. Cartwright was much distinguished both by external and internal endowments, and few persons shared a greater degree of attention and applause. Four plays, and four other poems, compassed in one volume, and prefixed by about 50 copies of commendatory verses, by the university wits, are the principal production on which our author's fame was founded. But his popularity does not seem to have been very extensive or durable; as only one edition of his works was published, and that at present very little known. He is also said to have written some Latin and Greek poems, a "Passion fermo," and two or three occasional poems. Biog. Brit. CARVA, in Botany, a name given by the Indians to one of the kinds of cinnamon tree. This is of all others the most esteemed amongst them, and serves for the greatest number of purposes. They extract camphor and liquid oil from the roots; they extract oil of cinnamon from the bark, and from the leaves they make another oil, which is called oil of cloves, and sold as such. The fruits yield them an oil resembling that of juniper, and afterwards they extract from them a thick, soft substance, like wax, serving them for the making of unguitants and plasters, and also for the making of their candles. CARVAGE, caravagia, the fame with CARRUCAGE. Henry III. is said to have taken carvage, that is, two marks of silver of every knight's fee, towards the marriage of his sister Isabella to the emperor. Carvage could only be imposed on the tenants in capite. Carvage also denotes a privilege whereby a man is exempted from the service of carvage. CARVALHAL, in Geography, a town of Portugal, in the province of Beira; five leagues S.E. of Porto. CARVALHO, a town of Portugal, in the province of Beira; four leagues S.E. of Coimbra. CARVALHO D' ACOISTA, ANTONY, in Biography, was born at Lisbon in 1650; and having devoted his life to the study of the mathematics, astronomy, and hydrography, undertook to give a topographical description of his country: with this view he traversed the whole country, following the course of its rivers and crossing its mountains. The result of his investigation is the best work on the subject, contained in three volumes fol. which appeared between the years 1706, and 1712. It comprises also the history of the principal places, the illusory men to which they have given birth, their natural curiosities, &c. He also wrote an abridgment of geography, and a method of astronomy. He died in 1715 in such a state of indigence, that he did not leave enough to pay the charges of his funeral. Nouv-Dict. Hist. CARVANCAS, in Ancient Geography, a mountain mentioned by Ptolemy, which terminated Norica, and also Pannonia to the west.
CAR

CARVANIS, a town of Cappadocia, placed by Ptolemy in the Pontus Polemaicus; probably the Carvans of

CARUCARIUS, in Ancient Law Books, he that
held land in soccage, or by plough tenure.

CARUCATE. See Carricate.

CARVE, in Rural Economy, a term signifying the fouring
of any sort of fluid; thus, to carve implies to grow four,
and is generally applied to cream.

CARVEL, in Ship-building. When the edges of the
planks are towards each other, the vessel is said to be car-
vel-built, in contradistinction to clinker or clinker-built, where
the edges of the planks over lap each other.

Carvel of St. Thomas, in Geography, a rock islet be-
tween the Virgin isles E. and Porto Rico on the W. At a
small distance it appears like a fmall, as it is white, and has
two points. Between it and St. Thomas, pacifies for Francis
Drake's channel.

CARVENDONCK, a town of Germany, in the circle
of Wittphalia, and duchy of Cleves; eight miles S.E. of
Cleves.

CARVENTUS, in Ancient Geography, a town of Italy,

CARVER, a cutter of figures or other devices in wood.
See Carving.

Carvers answer to what the Romans called sculptores, who
were different from caliatores, or engravers, as these lab
wrought in metal.

Carver is also an officer of the table, whose business is
to cut up the meat, and distribute it to the guests. The
word is formed from the Latin carpiter, which signifies the
same. The Romans also called him corpus, sometimes febr-
for, feundei majigler, and fevitor.

In the great families at Rome, the carver was an office
of some figure. There were masters to teach them the art
regularly, by means of figures of animals cut in wood. The
Greeks also had their carvers, called karpis, q. d. deribatore,
or distributores.

In the primitive times, the make of the fealt carved for all his guests. Thus in Homer, when Aga-
mennon's embassadors were entertained at Achilles's table,
the hero himself carved the meat. Of later times, the same
office on solemn occasions was executed by some of the chief
men of Sparta. Some derive the custom of distributing
every guest his portion, from those early ages when the
Greeks first left off feeding on acorns, and learned the use
of corn. The new diet was so great a delicacy, that to
prevent the guests from quarrelling about it, it was found
necessary to make a fair distribution. Athen. Deipn. lib. 1.
cap. 15. Potter. Arch. lib. IV. cap. 10.

In Scotland the king has an hereditary carver in the
family of Annluther.

Carver, in Geography, a township of America, in the
state of Massachusetts and county of Plymouth. Here is a
pond containing such quantities of iron-ore, that 300 tons
have been taken out of the clear water in a year. Upon the
stream which runs from the pond is a furnace; and the iron
made of this ore is better than that made of bog ore, and
some of it is as good as refined iron.

Carver's river, a branch of St. Peter's river, which
discharges itself into the Millifiopi. See St. Pierre.

CARUGNA, in Geography, a town of Piedmont; in
the merquitate of Ivrea; 8 miles S.W. of Jurca.

CARUI, in Botany, pratense officinarum. Bauh. pin.
138. (Tourn. Cl. 7. gen. 4.) See Carum Carui.

Carui, folius tenuissimi; Tourn. See Sismon verticillatum.

Caru alpina; Bauh. pin. See Seseli Pyrenaeum.

Caruifolia; Bauh. pin. Villars. See Selinum caruifolia.

CARVILLAN, in Geography, a small island near the
W. coast of Scotland, a little to the N. of the island of
Gigo.

CARVIN-EPINOVY, a town of France, in the depart-
ment of the Aisats of Calais, and chief place of a canton,
in the district of Bethune; 4 leagues E. of Bethune. The
place contains 4562, and the canton 14,887
inhabitants; the territory includes 50 kilometers and 11
communes.

Carving, in a general sense, the art or act of cutting
or fashioning a hard body by means of some sharp
instruments, especially a chisel. In which sense, carving
includes matting and engraving, as well as cutting in wood.

Carving, in a more particular sense, is the art of en-
graving or cutting figures in wood. In this sense, carving,
according to Pliny, is prior both to matting and painting.
See Cutting in wood.

CARVIST, in Ulteria. See Falcon.

CARULA, in Ancient Geography, a town of Spain, in
Bretica, between Batavillo and Lipia, according to the An-
tiquine Itinerary, supposed to be the present Villa-Nuevo-del-
Rio.

CARUM, in Botany. (Said to derive its name from
Carum, in the wild, where the original species grows abun-

Gen. Ch. Cal. Umbel universal, long; rays ten or more,
ofen unequal; umbel partial, crowded; involues universal,
omonophyllous; parthenium febrceis. Ccr. uni-
versal, unico; forces of the disk frequently abortive.
Cor. proper unequal; petals five, unequal, obtuse, keeled,
infex-embarrate. Stam. Filaments five, capillary, length
of the corolla, caducous; anthers roundish, very small.
Pil. germ inferior; styles two, very small; stigmas simple.
Peric. none; fruct ovate-oblong, twisted, divaricate into two.
Seeds two, convex on one side, flat on the other.

Eli. Ch. Fruit ovate-oblong, divaricate, general involuclo
most commonly monophyllous. Petals keeled, infex-
embrate.

Woodville. Med. but. pl. 45 Eng Bot. 1523. (Sefeli
carui; Roth Germ.) * Stem branched; straths of the
leaves dilated; partial involuclo, molt commonly none.
Wild. Rost spindle-shaped, biennial. Stem about two
feet high, angular, furrowed, smooth. Leaves fesh,
doubly pinnate; cut into linear narrow segments, the
lowermost of which cross each other. Umbels numerous,
terminal, uprjght. General involuclo of one, two, or three
small, narrow, entire leaves; partial one almost always none.
Petals nearly uniform, white or very pale flesh-colored,
infexed so as to become heart-shaped; calyx entire.
The central flowers only fertile, according to Dr. Smith;
but Linnaeus describes the flowers of the cef as being sometimes
abortive, and Dr. Withering affirms that they are all fertile.
Fruit small, oblong, twisted, each seed almost cylindrical.
Dr. Smith. The seeds are well known to have a pleasant
fruity smell, and a warm aromatic tale; and on that account
they are a common ingredient in cakes, and are encrusted
in figur for comfits; they are also distilled with spirituous
liquors to improve their flavour. The tender leaves in
the spring are boiled in soups; and the roots are said by Parkin-
son to be better eating than parnips. The seeds are esteemed
to be carminative, cordial and galactochic, and recommended
in dyspepsia, flatulenties, and other symptoms attending
hysterical and hypochondriacal disorders; they are also re-
ported to be diuretic and to promote the secretion of milk.

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An essential oil and a distilled spirit are directed to be prepared from them by the London college. They give off the whole of their virtues by moderate digestion, to rectify the spirit. Watery infusions are stronger in nux oil than in the distilled tincture, but weaker in tincture. In distillation or evaporation, water clears all their aromatic part; the remaining extract is almost inodorous, and thus discovers that there is in them less of a bitterish or ungrateful matter joined to the aromatic than in most of the other warm European seeds. Along with the aqueous fluid there arises in distillation an essential oil in the proportion of about one ounce from thirty, which is hotter in tincture and more pungent than that obtained from most of our other warm seeds. Woodville. A native of many countries in the northern part of Europe. In England it is found apparently wild, but, as Dr. Smith thinks, only accidentally naturalized, in Bedfordshire, Cambridgeshire, Suffolks, Norfolk, Lincolnshire and Yorkshire. On the banks of the Humber, near Hull, it is so abundant, that great quantities of the seeds are collected every year by the poor people and sold to the apothecaries and confectioners. It is cultivated in several counties, particularly in Essex; and in others, intermingled with coriander and teasels. Twelve pounds of caraway, ten of coriander, and twelve of teasels, are a proper quantity for one acre. They require flesh land which has lain long in pasture, and a soil consisting of a strong clayey loam. The plants should be ploughed, fowed, and harrowed about the beginning of March. In about ten weeks the plants will be strong enough to bear hoecing, which should be repeated three times in the course of the summer. The coriander being annual will be fit to cut about the beginning of July, and is threshed in the field on a cloth in the manner of rape. The ground should be hoed when the flowers begin in April and June, and needs no other culture; the caraway will be ready in the beginning of July, and the teasels about the middle of September. Mart. Miller, 2. C. simplex, Willd. 2. *Seml quite simple; theheads of the leaves pressed close to the stem; partial involucre of many leaves.
was confined by sickness to his bed, a furious tempest arose in the camp, accompanied with angular darknes, and incessant flashes of lightning, and a loud clap of thunder was succeeded by a sudden cry that the emperor was dead. It soon appeared that his chamberlain, in the paroxysm of their grief, had set fire to the royal pavilion, and hence a report originated that Carus was killed by lightning; when in truth he died of the disorder with which he had been seized. Such is the account given by his own secretary to the prefect of the city. Aelius Aper, the pretorian prefect, is accused by Vopiscus with having occasioned this catastrophe, and as he afterwards contrived the murder of Numaecian, and the emperor's tent was set on fire, the suspicion against him is confirmed. The death of Carus happened in the close of the year 283 after a reign of 16 or 17 months. His temper was haughty, and his manners harsh and int substantial; however he was startled by an eclogue on his accession to the throne, and after his death ranked among the gods. Carus and his two sons bore the names of Marcus Aurelius. Creveri's Hist. of the Emperors, vol. ix. Gibbon's Hist. vol. ii.

Carus, in Medica, a disease which, according to the definitions of Sauages, and some other noalologists, differs from apoplexy only in the absence of the tertian noise in breathing; and in the forer (or morbid sleep) being somewhat to profound. It is properly considered by Dr. Cullen as a minor degree of apoplexy. (Synop. Nosol. Meth. p. 184.) See Apoplexy.

Carusa, in Ancient Geography, a town of Asia Minor, in Paphlagonia, seated on the Euxine sea. Seylax calls it Carus, and says that it was a Greek city, between the river Halys and the town of Sinope. Ptolemy calls it Carisa.

Carwaite, or Carvattus, in Geography, a town or rather village of Prussia, in the country of Samband, belonging to the government of Memel, the inhabitants of which infift by fishing: 44 miles N. of Konigberg.

Carwar, a maritime town of Hindoostan, situate on the coast of Malabar, between Merzaw, or Merhree, and cape Ramas in the neighbourhood of Gos, where the East India company have a factory; but better known to the English in the early period of their India trade, and before they were in possession of Bombay. The vallors about it supply plenty of corn and pepper of an excellent kind. The woods on the mountains abound with quadrupeds, such as wolves, monkeys, wild hogs, deer, elks, and beees of a prodigious size. It is distant about 40 miles S.E. from Goa. N. lat. 15° E. long. 74° 16'.

Cary, Lucius, in Biography, vicount Falkland, was the son of Henry vicount Falkland, and lord deputy of Ireland in the reign of king James I; and born, probably at Burford in Oxfordshire, about the year 1610. Being removed at an early period to Ireland, he received part of his education at Trinity college in Dublin, and completed it at St. John's college in Cambridge. In his youth he was chargeable with some irregularities; but before he had attained the age of 20 years, he came into possession of a large and independent fortune, that had descended to him in consequence of the gift of a grandfather, and he terminated his career of distinction by marrying a young lady of distinguished accomplishments but small fortune, whom he passionately loved. In forming this connexion he gave great offence to his father, who had entertained hopes of amending his own circumstances by his son's marriage; and though he made ample concessions, and even offered to surrender his whole estate to the disposal of his father, and to depend wholly on his kindnes for a subsistence, his father remained unrelenting and irreconcilable. Distressed by this circumstance, he determined to leave England; and accordingly he removed, with his wife, to Holland, where it was his intention to pursue some military command; but failing to accomplish this object, he returned to his own country, where he lived in retirement and prosecuted his studies, with uncommon affluence and ardour, maintaining at the same time an intercourse with some of the best scholars of that age. In a very short time he is said to have made himself perfect master of the Greek tongue, and to have read with an accurate attention all the Greek historians. Before he was 23 years of age, he had perused all the Greek and Latin fathers; he also made himself acquainted with all books, which he procured at a great expense from different countries; he likewise diligently studied ecclesiastical and theological controversies; and his memory is said to have been so retentive, that he remembered, on all occasions, whatever he read. In fame of his poetical attempts he was so successful as to have gained the esteem and admiration of the most eminent poets of his time. About the time of his father's death, in 1635, he was made one of the gentlemen of his majesty's privy chamber. He spent the remainder of his life, and frequently retired to his seat near Burford, which by the visits of literary men from the neighbouring university was a kind of academy. Here Chillingworth wrote his admirable work against popery, deriving applause in the composition of it from the suggestions of his lordship. In this retreat various questions of literature, morals, and theology were freely discussed; and here lord Falkland himself, whilst he was entitled to pre-eminence on account of his extensive literature, blended with it that modesty and candour, and sweetness of temper, which commanded the admiration and esteem of his learned visitants, no less than his disinterested abilities and attainments. His habits, however, were not formed in this literary retreat for those public scenes in which he afterwards engaged. In 1639 lord Falkland joined the expedition against the Scots; and in 1640 he was chosen member of the House of Commons for Newport in the Isle of Wright; his parentage, being Scotch, not entitling him to a seat in the House of Lords. By his attendance on the debates of the house, he acquired a high degree of veneration for the authority of parliament; and he was to rigid an observer of established laws and rules, that he thought no mischief so intolerable, as the presumption of ministers of state in breaking positive rules for reasons of state, or of judges in transgressing known laws, upon the plea of convenience or necessity. Accordingly he was more severe than his natural gentleness of temper allowed in other cases, against lord Finch and the end of Straford; and he had conceived such a dislike to archbishop Land, and some other bishops, that he concluded in the first bill for depriving them of the right of voting in the House of Lords. Hence some persons were led erroneously to conclude that he was no friend to the established government of the church; whereas on subsequent occasions, when he began to suspect the designs of the parliamentary leaders, he opposed the same measure to the utmost of his power. For some time he continued averse from the court, and manifested even a moroseness to councillors; but at length he was prevailed upon to accept a seat in the privy-council, and the office of secretary of state. But he was not for tablets of this kind, as he was totally unacquainted with the forms of business, and as he was actuated by scruples which impeded the prosecution of it. He would not agree either to the employment of spies, or to the opening of suspected letters. When the breach between the king and parliament came to a crisis, lord Falkland took a decided, firm, and active part with his matter;
waller; and attended him, with considerable danger to himself, at Edgehill battle, at Oxford, and at the siege of Gloucester. During his residence at Oxford, a circumstance occurred which shall here restate. When he jealously visited the library, he was thrown, among other books, a Virgil elegantly printed and bound; and Lord Falkland, deeming of amusing him, desired him to try his fortune by that mark of divination which was called Santa Virgine. When the king opened the book, the page which presented itself was part of Dido's incantation against Aeneas (L. iv. v. 613, &c.), thus translated by Dryden:

"Opprest with numbers in th' unequal field,
His men disencourag'd, and him He expell'd,
Let him for forcour fortune from place to place,
Torn from his subjects, and his son's embrace, &c."

The king's mind seemed to be impressed by this accident; and, therefore, Lord Falkland, hoping for a more favourable occurrence, determined to try his own fortune in the same way; but the page which chance presented him was more suited to his own destiny than the other had been to the king's. It was the following exclamation of Evander upon the untimely death of his son Pallus (Aeneid, lib. xi. v. 172, &c.), thus rendered by Dryden:

"O Pallus! thou hast fail'd thy piastred word,
To fight with caution, not to tempt the sword:
I warn'd thee, but in vain; for well I knew,
What peril youth and valor would pursue;
That boiling blood would carry thee too far,
Young as thou went in dangers, raw to war!
O curst effay of arms, disfatast doom,
Prelude of bloody fields, and fights to come."

When Lord Falkland perceived the calamities that were impending over his country, his spirit sunk; he left the gaiety and licentiousness of his temper, became negligent of his drees and appearance, reserved and morose, and indicated a mind dissatisfied with itself and the world. While sitting among his friends he would frequently, after long silence and deep sighs, with a shrill voice repeat the words "peace."

"peace," and declare himself incapable of living in such a state of perpetual grief and anxiety. The offending scene proves almost a determination to throw away life that which was becoming a burden. Although poisselling no military command, he resolved to be present at the battle of Newbury, fought September 20th, 1643; and in the morning called for clean linen, that if he were slain his body might appear with decorum. Having put himself in the first rank of Lord Byron's regiment, he received a musket shot in his belly, and fell from his horse. His body was not found till the next day. Such was the fate of Lord Falkland, in the 54th year of his age; generally esteemed the most virtue public character, in a period fertile of virtue. His praises have been reflected by poets, historians, and moralists, and are, as it were, interwoven with English literature. His fame perhaps owes most to his intimate friend Lord Clarendon, who has drawn an elaborate character of him, and in some respects makes him the moral hero of his history. Lord Falkland left behind him some poems, and various speeches and pamphlets on political and theological topics. Biog. Brit. Gen. Biog.

CARY, ROBERT, a learned chronologer, was born at Crockettin, in Devonshire, about the year 1615. He finished his education at Oxford, whither he went in 1631, and where he took his degrees, and was created doctor of laws in 1644. He travelled into foreign parts, and on his return was presented with the rectory of Portland, near Kingsbridge, in Devonshire. During the troubles he joined the Presbyterians party, but upon the restoration of Charles II. he was one of the first who congratulated him on his return, and was soon after preferred to the see of Exeter. But after about two years he was ejected, in 1664, and retired to his rectory, where he passed the remainder of his life with reputation, and died in September 1683. He published his "Eadologia Cornucopia, or a chronological Account of Ancient Times, in three parts, 1. Didatical, 2. Apodictical, 3. Canonical," Lond. 1672, fol. Of this book we have an account in the Philosophical Transactions, N. S. cxxxii. p. 395. He was, in his younger years, skilled in poetry, both Latin and English; but his only publication of this kind was those hymns of our church which are appointed to be read after the lessons, together with the credal, &c. They were translated by him into Latin verse. Biog. Brit.

CARY, in Geography, the name of a small river in the county of Antrim, Ireland, which uniting with some other mountain streams falls into the North Channel, at Bailey-caul.

CARY, the northern barony of the county of Antrim, Ireland, opposite to the Island of Rathlin, and remarkable for the Basaltic region of which the Giant's Causeway is a part. It was anciently called the Route, or Rest, and was taken possession of by the clan of McDonalds from the Hebrides, some time previous to what has been called the plantation of Ulster, in the reign of James I., the Baronie received its present name from a caille now in ruins. Some old maps have also a cape marked Ca-Cary, which must be what is now called Torr-point. Hamilton's Antrim.

CARY Bay, a large bay on the south coast of Cornwall, round the point of the Deadman to the westward, and extending almost to the eastern point of the entrance into Falmouth haven.

CARYA, in Ancient Geography, a country of the Peloponnesus, in Laconia, the country of which was of the same name. Vitruvius mentions the destruction of this city, because it united with the Persians, who were enemies to the Greeks. The male inhabitants were put to the sword, and its females were made captives. Pausanias says, (Lacon. l. iii. c. 10. p. 270) that it had a temple of Diana Caryatis, and a statue of that goddess in the open air. It was situated on the banks of the river Eaus, a little to the west of Gympes. See Carlytes and Caryatides.

CARYA, See Cary.

CARYANDA, an island of Alia Minor, in the Mediterranean, on the coast of Caria. Pliny.—Allo, a town of Alia Minor, in Caria. Steph. Byz. says, that it was a sea-port, near Minius and Ces. Selvax, who was of this city, says, that Caryanda was an island, town, and port. It has since been called Carcasson.

CARYATES, in Antiquity, a festival in honour of Diana, furnished Caryatis, held at Caryum, or Carya, a city of Laconia. The chief ceremony was a certain dance, said to have been invented by Calliror and Polux, and performed by the virgins of the place.

During Xerxes' invasion, the Laconians not daring to appear and celebrate the customary solemnity, to prevent incurring the anger of the goddeses by such an intermission, the neighbouring swains are said to have assembled and sung pastoral, or bacchylides, which are said to have been the origin of boculic poetry.

CARYATIDES, in Architecture. Besides columns and pillars, statues of various kinds have been employed by architects for the same purposes. Female figures of this nature clothed in long garments were called by the Greeks Caryatides, the reason of which is thus explained by Vitruvius, lib. i. The inhabitants of Carya, a city of the Peloponnes-
Sculpture appears to have been in Egypt entirely subordinate and subservient to architecture, an art which had no motive but religion, no object but the decoration of its edifices; whether it led up to the temple gate the long avenue of sphinxes, emblems of the mystery which overshadowed its walls or seated in sublime tranquillity, the colossal effigies of its gods; or inscribed on columns triumphally ite its secret doctrines and exclusive knowledge.

When we consider the nature of the Egyptian statues and the timidity of the artists who never separated the legs, and generally attached the figure behind to a square slab or pillar referred out of the blocks, we shall not be surprised that independently of any religious motives which might lead to the use of Caryatides, the idea should originate of employing for the support of buildings slates which did not yield in real solidity and apparent height to any species of columns. If also we consider the style of sculpture, its rigid symmetry of attitude and motionless inflexibility of appearance, we must allow that no statues were better adapted to take the place of columns, and no where were the objections which may be urged against the use of Caryatides left founded. Accordingly, it seems probable that no where was this custom more prevalent than in Egypt.

We may perhaps form the best idea of the Egyptian Caryatides from those which at present support the entablature of the great door of the Museum Vaticano. These statues were found in the villa of Adrian, and were probably among those which that emperor, so deftful of imitating Egyptian customs, caused to be made in the manner of those which existed in Egypt. They are seven feet in height, including the plinth. The capitals which rest above their heads are of the bell shape so commonly observed in the Egyptian remains. The appearance of these Caryatides is singularly grand, in spite of all the incongruities of their situation and of the details of the architecture which accompanies them.

The Hindoo excavations in the mountains of Ellora near Aurungabad in the Deccan; works of whose origin history has preserved no memorial, but whose stupendous execution ranks them among the wonders of human labour, may be cited among the instances of the use of Caryatides. In one of these the Kailasa, or paradise of the gods, a monument which presents the appearance of a vault and elaborate building, standing in a considerable area, the whole of which is excavated in the granite rock; the basement of this afromishing edifice is sculptured with the figures of elephants and lions, giving the whole mighty mass the appearance of movability by these powerful animals. The excavated rocks of Mauelpiporam offer singular pillars, each being composed of the figure of a lion sitting on a double plinth, forming the lower part of the shaft, which rising octagonal-ly and tapering, terminates in a capital consisting of three horses, which support the entablature. In one of the excavated temples on the island of Salsette, there are capitals well executed, and composed chiefly of elephants, to which, in some instances, are added horses and human figures. In Jaganatha Sabha, another of the excavations of Ellora, the pillars rest upon elephants. Danieli's Antiquities of India and Hindoo excavations.

The description of the temple of Jerusalem preserves some traces of this custom. Hiram's molten sea was supported by twelve bulls, and on the walls of the oracle he placed alternate cherubim and palm trees, supporting wreaths of flowers and probably the ceiling.

In the ruins of Persepolis also, there remain some capitals consisting of horses and camels. And in geographical, though not in chronological order, we may mention some
CARYATIDES.

Influences at Paulyra. The colossal cornice of the great temple has multitudes in the form of bulls and lions, supporting the cornice, and in more than one example figures of genii are used to sustain a kind of projecting balcony in the singular tower-shaped massalumna which are found there.

Though however the idea of employing Caryatic figures is not original to Greece, the most complete and interesting example of this practice is among the ruins of ancient art at Athens. "To the north of the Parthenon, at the distance of about one hundred and fifty feet, are the remains of three considerable temples. That towards the east was called the Erechteum; to the westward of this, but under the same roof, was the temple of Minerva, with the title pallas, as protectress of the city; adjoining to this, but under the same roof, is the Pandroseion, so named because it was dedicated to the nymph Pandroseion, one of the daughters of Cecrops." This is an open portico, composed of six Caryatides, four being placed in front and two in the sides, five of the flutes remain to the present time. Within the Pandroseion was the olive tree, said to have been produced by Minerva in her contest with Neptune for the patronage of the city; it was called paxianthus, incircated, from its branches having bent downwards after it had grown up to the roof; and under the tree stood the altar of Jupiter Hercule. (Stuart's Athens.) These Caryatides agree perfectly with the description of Vitruvius: they are designed in a large and broad style, their drapery is ample and flowing, their hair arranged with art. The height of the figures is nearly nine feet, including the capital and plinth: their attitudes are simple and symmetrical; their air serene and tranquil. The flutes are placed upon a continued pedestal, but with separate plinths to each. Above the head rises a capital, somewhat resembling that of the Doric order, and upon the capitals is placed an entablature, very nearly three feet high, but consisting only of architrave and cornice, the frieze being suppressed. The cornice is dentiled and the mouldings enriched; the upper fascia of the architrave is singularly ornamented with little round cloisons equal in size. It is not easy to account for the singularities of the entablature and its extraordinary height compared to the figures; probably Caryatic portico was not intended as subject to any of the common rules of architecture. The reader will find an elevation of this monument in Plate XIX. of Architecture.

The Caryatides of the Villa Albani are another beautiful example; they are female statues clothed in long garments, the arms and necks ornamented with bracelets and necklaces, the head-dresses carefully arranged. A Greek inscription on one of them informs us, that they were the work of two Athenian sculptors, Crito and Nicholas. Winckelmann is of opinion that these artists arrived at Rome about the time of Julius Caesar; but whether these figures were executed at Rome, or transported there by some Roman plunderer, cannot be known. It seems probable, from a certain want of symmetry in their attitude and ornaments, that they are only part of a larger number and were not intended to be arranged contiguously. One of them has the head enveloped in a veil, which ascends to the top of the capital. The capital of another is plain and without ornament, the others are decorated with as much elegance as richnefs.

Among the antiquities of Rome there are various fragments of statues, which, from their attitudes and the capitals on their heads, may be supposed to have served as supports to the entablatures of buildings. It appears, that the inside of the Pantheon was ornamented in this manner by Dioneus the Athenian; they were probably executed in brass relief, and employed in the Temple of the Sun.

In the tomb of the freedman of Sextus Pompeius, on the Appian way, there was an example of Caryatides of both sexes. They are in brass relief, and decorated rather than support the different stories of the colonnade. The first order consists of female figures, draped, with extended arms, supporting a great volute which entirely surrounds them. They have no capitals; but their feet are mounted on small plinths. The Caryatides in the upper story are of a particular kind, and of an invention sufficiently explications. They are staked figures, whose heads, adorned with capitals, support the cornice, and in their hands each holds a column, proper duly, which supports nothing. This fancy form has given rise to one still more whimsical, which has been executed by Daniel de Volterra, in his chapel of La Trinita del Monte, where there are figures supporting in one hand a capital, and in the other the column adapted to it.

These freaks of imagination, it is hardly necessary to observe, are only tolerable in the arabesque, where may be found an ample collection of figures, which the caprice of decoration has adapted to the office of Caryatides.

It would be generalizing too far to include, among the subjects of this article, the compositions of various gods, terms, grimis, and so many other fantastic animals which adorn and support altars, tripods, vases, and other antique utensils. These objects, though confined by the realities of execution and the convenience of use to more connection and probability than the dreams of arabesque, are not amenable to the grave laws of architecture. It is on account of not having perceived the limits of imagination in these different walks of arts that the Caryatides, which were originally a licence in architecture, have become, under the chisel of the moderns, abuses intolerable and unworthy of indulgence from the least inquisitive reason.

This censure is not, however, applicable to the earliest receivers of this style of decoration; and we must do the justice to that distinguished artist Jean Goujon, to allow, that in the beautiful Caryatides which support the tribune of the former faute des jardins de Louvre, he has conceived an idea just, grand, and superior to every other modern influence. This monument consists of four female figures, twelve feet in height, elegantly draped, with capitals on their heads, and standing on circular pedestals; which support an entablature of the Ionic order, richly ornamented, one quarter of the height of the statues and pedestal. What is remarkable, the artist has represented the arms of the figures as terminated a little below the shoulder. It is certain, that this influence bears considerable resemblance to the Caryatic portico at Athens, by the general idea of a gallery projecting from a larger mass of building, by the number of figures being in both cases four in front, their symmetrical arrangement, and particularly by the arms, which may be thought to be truncated in imitation of those which time has mutilated. We cannot say, however, whether or not Jean Goujon had any knowledge of the Athenian Caryatides; if not, the merit of the invention and composition does the greatest honour to his genius; and even if he were acquainted with them, such an imitation shows consummate taste and judgment, while the details remain intirely his own.

It is difficult to find a subject of approbation in any other modern influence of Caryatic figures. Thoie of the celebrated Loggia de Lanzii, by Orcagna at Florence, and a multitude of other Atlantes in that town and elsewhere, which are seen bending under the weight of an architecture which crushes
CARYATIDES.

crushes them, are but capricious inventions, where the sculptors have rather considered their art than its harmony with the architecture.

Every one who is acquainted with the history of the fine arts after their revival in Italy, knows how much the style of sculpture and architecture was influenced by that of painting. Painting was the favourite art, that which produced most genius, and was often exercised in common with the other arts by the same perfon. But it would not be difficult to show, were this the proper place, that the principles of painting are very frequently in contradiction to those of sculpture, and still more of architecture. Hence, arose a most abundant crop of abusés, from which the immediate proximity of antique examples could not preserve the building art, when the painters of decorations became its arbiters, and fictitious architecture its model. Among these must be reckoned the Caryatic figures, which became the common ornaments of ceilings and vaults under the Carraci, Doremi, Lanfranco, and many inferior artists and imitators.

The composition of these had no other rule than the caprice of the painter, who regarded them as a kind of academy figure, susceptible of all the extravagancies of attitude and all the orientation of anatomy.

We now come to the theoretical and critical portion of this article; and, in the first place, it merits consideration, whether the employment of Caryatides is not radically faulty as violating nature and the essential principles of imitation. It may be urged as an obvious improvidence to make the figures of men and women support the enormous load of the entablatures and coverings of buildings. The sight and imagination seem to be equally offended by the necessity of admitting the representation of circumstances of which the reality cannot for an instant be supposed possible.

If the example and authority of perhaps all nations who have been distinguished in architecture were considered sufficient, these objections would be answered by the preceding article; but as this custom might have no other than religious and political motives, it is not impossible that taste and rational criticism might be at variance with such institutions, and agree to banish from modern works a practice which, having no longer any connection with these motives, or any other object than the gratification of the sight, offends gratuitously the principles or the appearance of solidity. We do not doubt, however, that Caryatides may be defended on the following considerations.

Sculpture, though it realizes in its imitations the external forms of objects, departs so widely from them in colour and texture, that no art is less capable of producing illusion: the sight is more affected by colour than figure. Zeuxis might deceive the birds with his bunch of grapes, and his competitor him with the curtain; but certainly a statue was never taken for a man. Accordingly, every production of sculpture may be considered both with regard to the object imitated, and the matter of which that imitation is composed. With regard to the first, nothing undoubtedly is more absurd than to cause a man to perform the impossible function of a column; but with regard to the second, nothing is less unreasonable and more possible than to give that office to a statue, whose solidity is equal, and material the same. Why not support a flown entablature with a statue equally of stone. When therefore figures are employed as Caryatides, it must be understood, that these figures are not the living and animated expression, but the material and motionless image of the object represented. On this occasion a kind of counter-illusion is required of the spectator; and it is necessary that, overlooking every thing of deception, which might lead him to forget the material, he should flout at the first impression of the facade, and instead of yielding flesh, see only inflexible marble and bronze. This is not a difficult effort but the natural imputation, when the sculpture in harmony with the architecture does not pretend to too much motion, action, and life. Nobody, in seeing the Egyptian statues, can say, that nature and probability could be violated by such allegorical supports.

On the other hand, when the defiderant of Kallafa observes, that the basement, sculptured with elephants and lions, gives the whole the appearance of mobility on these mighty animals; he reports a severe cenure, for this is exactly the air that a great edifice ought not to have.

From what has been advanced, it cannot be denied as a general proposition, that Caryatides are admissible in the most regular and consistent architecture. Reaflon demands real, and tells apparent, solidity in supports; now the first exists inseparably in the material of which these figures are formed, and the second may be preferred with attention to the rules of propriety, indicated by the nature of the objects, and which we shall proceed to discuss.

Considering the preceding observations, good taste will include in a general censure, all the figures so commonly seen bending under the masses which overwhelm them, those symbols of every whole laborious attitudes affect the spectator with ideas of oppression and misery. The more the sculptor displays of anatomy, the more forcibly he expresses the contraction of the muscles; in short, the more he gives of truth, in the action and movement, the more he will incur of blame from sound criticism. His figures appear weaker as they make the more effort; and though good statues, they will be bad Caryatides.

Let the figures intended for this purpose, broad and grand in their proportions, approaching the colossal in dimensions, simple and upright in attitude, severe in expression, present to the spectator an immovable tranquillity in their appearance. Let symmetry prevail in their position and accessories. Let the apparent weakness of the neck be corrected by trebles of hair defending on their shoulders, and the drapery, agreeably defining the forms of the limbs, but tending to perpendicular folds, strengthen the figure below, and give solidity to the whole. Thus we have almost described the Caryatides of Athens, or of Jean Goujon. This artif, a sculptor and architect, had so well conceived the rules of taste proper to the species of sculpture in question, that to take away all pretence of illusion, he has represented the figures, as has been already mentioned, without arms, and under the appearance of mutilated effigies. However, without carrying our speculations so far on this point as Jean Goujon, it will be sufficient to imitate him in the general character of gravity and austerity which he has imprinted on this performance.

It seems necessary to give capitals to Caryatic figures to prevent the disagreeable sensation produced by the architectural reeling immediately on the head, and to avoid the abrupt contact of the forms of sculpture and architecture by an intermediate object partaking of both. The capitals in antique examples sometimes approach the Doric form, as in the Athenian Caryatides, and sometimes the Corinthian bell-flame, as in those of the Villa Albani. The first is rich and well adapted to the shape of the head, the other has more lightness and elegance. It is proper in these things to keep a medium between the rigour of architecture and the caprices of mere ornament. Some antique capitals have been found imitating a basket, but these cannot be recommended.

Caryatides as statues require to be raised on pedestals. In the Athenian instance a continued stylobata answers this purpose.
purpose. Jean Gecon has used inflated pedestals, which are circular, apparently to give more of the air of a column to the whole.

The Pandæmonium at Athens, though only one example, is of the highest importance as being complete in itself, giving not only the best model of the figures proper for the purpose, with their appropriate pedestal and entablature, but also the relative proportion of such a portico to the adjoining building, and of Caryatides to columns. The entablature, as has been before observed, is very remarkable in several respects, and first, in height compared to the figures being 2 feet 8 inches to 7 feet 9 inches. We may perhaps find the motive of this extraordinary weight in considering that a human figure appears draped as though it were, present a larger mass than any column. However, it cannot be denied, that the proportion of the entablature is greatly exaggerated, and produces an unpleasing effect. In the next place, the frieze is supprefled, a singularity which we believe is not to be found in any other antique monument of the smallest credit, neither is the effect very good, as the mass is too much divided into equal parts. On the whole, though it would be absurd to conclude from a single example, that the ancients had adapted any one particular entablature to this kind of order, we may infer from such remarkable deviations that these objects are not to be considered within the limits of regular architecture, but are at the discretion of the designer within the limits of reason and taste.

The proportion of Caryatides to columns when seen together, is another point that will require attention in execution. That the first should be less evident, but it is impossible to say what dimensions will in all cases have the best relation. The figures ought to appear colossal without cefcething the effect of the columns. The proportion observed in the Athenian example, where this effect has been very happily attained, are, 7 feet 9 inches, the figures, 18 feet 5 inches, the columns which are the nearest in contact.

The proper application and allegory of Caryatides will come next under consideration. Chambray, an able and eloquent author, whose opinions always merit attention, observes in the "Parallele de FArchitecture antique avec la moderne," that there are few occasions in which Caryatides can be employed with propriety, though the generality of modern architects have introduced them indiscriminately in all kinds of buildings. For not only in the palaces of princes, and without, but in private houses, and in churches, even, and sepulchres, every place is filled with them without any regard to history or decorum; and often, by an insupportable absurdity, they substitute for their miserable captives the venerable figures of virtues, muses, graces, and even angels, where they ought rather to enliven and confine the vices.

In reply to this, we must observe, that if the art be confined directly to the origin and motive attributed to this practice by Vitruvius, he can never employ Caryatic figures. The memorial of an outrageous severity inflicted on the fair and innocent, is unworthy to be perpetuated.

The Persian gallery of Sparta, though not consistent with the delicacy of modern feelings, was a noble trophy of valour and patriotism worthy of the occasion, and worthy of the people; but the people were Greeks, and the occasions Thermopylae and Plata. Such deep injuries, and such glorious revenge, may well justify a triumph, that in moderate wars would be barbarous and unmanly. Thus did the boney heap of Murten record and inspire the patriotic valor of the Swiss. But the modern artist is called upon by every feeling of propriety, to reject these emblems of vengeance, these miserable captives, whose figures only excite contempt towards the inflicting conqueror.

Caryatic figures are in themselves more picturesque and interesting than any columns, but the proper employment of them is on this account more difficult. They have too much character to enter indifferently into ordinary works. Of a nature we demand an explanation, and the occupation of Caryatides seems to render it proper that they should be the representations of allegorical personifications rather than of human individuals. A full and consistent allegory is then the requisite of Caryatides; but to represent them as mere statues, without any meaning, as Jean Gecon has done, forms both an impropriety and a poverty of invention; and with deference to M. Chambray, we can conceive situations where the figures of virtues, muses, and angels, would be both beautiful and proper. Purcell, Norden, Denon, Dict. Math. Stuart, Dandie, Chambray.

CARYLL, JOHN, in Biography, one of the ministers ejected by the act of uniformity, was born in London in 1622, educated in Exeter college, Oxford, and afterwards became preacher to the society of Lincoln's Inn. He was a member of the assembly of divines, and one of the taylers for approbation of ministers; and in all the stations he occupied maintained a respectable character for learning, piety, and modesty. By order of parliament he attended the king at Holmeby house, and was one of the commissioners in the treaty of the Isle of Wight. After his ejectment in 1662, he lived privately in London, and preached to his congregation whenever the times allowed. He was a moderate "Independent," and distinguished himself by his learned and voluminous "Exposition on the book of Job." He died in February, 1572-3, in the 71st year of his age. Neal's Hist. of the Puritans, vol. II. p. 689. 4to.

CARYLL, JOHN, an English poet of the Roman Catholic persuasion, was secretary to queen Mary, the wife of James II.; and having shared the fallen fortunes of his master, was rewarded for his attachment, first with knighthood, and afterwards with the honor titles of earl Caryll and baron Dartford. In the reign of queen Anne he was in England, and recommended to Mr. Pope the situation of the "Rape of the Lock," who at its publication addressed it to him. He was the author of two plays, viz. "the English Princes," &c. 1667, 4to.; and "Sir Solomon, or the Cautious Coxcomb," 1671, 4to.; and in 1700, he published the "Psalms of David, translated from the Vulgate," 12mo. He was living, at a very advanced age, in 1717; but the time of his death is not ascertained.


CARYOCATACTES, in Orchidology, the nut-cracker of English writers, is so denominated by Gesner, Willughby, and Ray, whence its Linnaean specific name. See Corvus Caryocatactes.

CARYOCOSTYNUM, in Pharmacy, a kind of purging elecary, the two principal ingredients of which, that give the denomination to the whole, are cloves, and coccus. It works briskly, and fetches the humours from the most remote parts; whence, and by reason of its warmth, it is prescribed against rheumatic, arthritic, hydroptic, paralytic, &c. disorders.

CARYOLOBIUS, in Botany, a genus formed by Gartner for the seed of an unknown East Indian plant, remarkable
marked for its singular structure, having within it a central pillar which perforates the axis of the embryo. It is laid by Boe., to be nearly allied to Coccuba.

CARYONES, in Ancient Geography, a people placed by Ptolomy in European Sarmatia, between the Alans and Amanobians. M. Peyfond clasps them among those who bore the name of Vandals.

CARYOPHYLLAST, in Botany. Rumph. emb. See DONAT. eifofea.

CARYOPHYLLATA. Tournefort, clafs 6, § 7, gen. 6. La March, Flor. Franc. 742, and Encyc. sub Denote. See Geum.


CARYOPHYLLATA, virginiana, Henn. par. See Geum virginianum.


CARYOPHYLLATA alpina, afpi foliis, Bauh. Pin. C. alpina tenusfolio, Barcel. See Geum repentum.

CARYOPHYLLATA alpina quisquefolia, Bauh. Pin. See ANEMONE narciisiflora.

CARYOPHYLLUM, in Botany, the forty second natural order in the Philosophy Botanica of Linnaeus, and the twenty-second in the Praefilection published by Sishe; so called, not as including the Caryophyllus of Linnaeus, which actually belongs to a different natural order; but in reference to the Caryophyllus of Tournefort taken up by him from the older botanists, which Linnaeus called Dianthus without affigning a sufficient reason for changing the name, and as he still continued to call the natural order of which his dianthus may be considered as the prototype, by its ancient appellation, with a certainty of introducing a palpable confusion into the nomenclature. He has been followed in both cases by Jussuf, without a comment; and by Ventenat, with a remark pointing out the incoherence. Linnaeus gives it the following character. Stem fibrous. Stem herbaceous, seldom shrubby, jointed: branches generally alternate. Leaves simple, almost always inclining to lanceolate, undivided, sessile, or narrowing into a petiole, opposite, most commonly smooth. Flower rarely sessile; flaments either equal or double the number of the petals; pistils from one to five. Fruit a capsule, one-celled, or with as many cells as there are flyles.

The genera enumerated in Philosophy Botanica are dianthus, faponaria, drypis, cuculus, filene, lychnis, coronaria, agrolcmmna, frankenia, aline, ceraflum, holocum, arenaria, pharnaceum, fipergula, fatama, moehringia, fcleranthus. In the pollinurn lectures they are divided into four sections: a. dianthus, faponaria, gypophila, veleiza, drypis, filene, cuculus, lychnis, agrolcmmna, thefieldia; β. fipergula, ceraflum, arenaria, filicana, aline, holocum, cherleria, fatama, moehringia, fupinana. γ. pharnaceum, glinus, mullugo, polycarpum, minutaria, quercia, ortega, luflingia, rota. ε. fcleranthus, polycrmmna. The first section comprehends the proper caryophyllace flowers of Tournefort, which have a tubular calyx, and unguiculated petals with a flat border.

Jussieu and Ventenat have given in most respects the same general character, and assign'd nearly the same genera to their caryophyllaceae. According to Ventenat the plants of this family are in general herbaceous and natives of Europe. Their flymes are comonly cylindrical, and never more than three or four feet high; branches axillary, opposite and apparently articulated at each knot. Leaves opposite and conuate at their base, very rarely whorled, always simple and entire, generally deflexed of filpules. Flowers almost always hermaphrodite, subject to become full or double by cultivation, commonly axillary, sometimes terminal. Calyx once- or twice-divided, almost always permanent. Corolla rarely none; petals generally unguiculate, equal in number and alternate with the segments of the calyx. Stamens in some genera less numerous than the petals; more frequently equal in number and alternate with them; or twice as many, half of them inserted into the receptacle, and the other half alternately into the petals. Germ simple; style rarely fingle; filgmas equal in number to the styles. Fruit capular, almost always many-seeded, one or many-celled. Seeds inserted into a central placenta or receptacle, or each of them attached to the bottom of the capsule by a small umbilical cord. Perispem farinaceous, central, i.e. surronded by the spiral embryo. Radicle inferior.

The whole order is divided by Jussieu into seven sections: 1. Calyx divided; flaments three; style fingle or triple. ortegi, helwingia, holocum, polycarpum, donatia, mollugo, minutaria, quercia. 2. Calyx divided; flaments four; styles two or four. Buffonia, fagina. 3. Calyx divided; flaments five or eight; styles two, three or four. Aline, pharnaceum, helwingia, chatina. 4. Calyx divided; flaments ten; styles three or five. Bergia, fipergula, ceraflum, cherleria, arenaria, filicana. 5. Calyx tubular; flaments less than ten; styles two or three. Velwia, drypis, farothra. 7. Genera allied to the caryophylaceae. Rotala, frankenia, linum, lechea. Ventenat has adopted the same divisions, but has omitted donatia, bergia, and rota; added cognes, and githago; and removed farothra to the gentianeae.

CARYOPHYLLON Pfini, the fruit of the cajfa caryophylwletas, or cloveberry tree, whose bark is used in medicine


Gen. Ch. Cal. Perianth superior, small, permanent; segments four, concave, spreidng. Cor. petals four, roundish, larger than the calyx and alternate, with its segments caducous. Stem numerous; flaments capillary, a little longer than the petals (but not so expressed, either in Sonnerat's, Woodville's, or La Mare's figures). attached to the outside of a quadrangular, hollow elevation within the segments of the calyx; anthers small. Pfl. germ inferior, oblong, two-celled; style simple, in the centre of the quadrangular elevation, but perfectly distinct from it; fligma simple. Peric. Berry oval oblong, one or two-celled, crowned with the permanent calyx, and quadrangular elevation. Seeds one or two, large.

Eff. Ch. Cor. four petalled. Cal. four-cleft. Berry inferior, one or two-celled.

CAR

philus, Lab. ic. 2 p. 147. "Thekinds, Bibou. arom. p. 177.)

-4. Leaves lanceolate, acuminate. A small tree. Trunk from fifteen to thirty feet high, a foot thick, dividing into branches four or five feet from the ground, and forming a dense pyramidal head; branches opposite, slender, generally horizontal, but to weak to stand in need of support when loaded with fruit. Leaves from two inches and a half to four inches long, near an inch and a half broad, with a strong midrib, and parallel lateral nerves, opposite, tapering at both ends, quite entire, smooth on both sides, reddish and rather shining above, bright green underneath, and bluish-green with minute reddish spots, which placed under a magnifier in a strong light, are generally transparent; petals from six to nine lines long, red, and according to Sonnert, the most aromatic part of the plant. In Sonnert's and Woodville's figure, they are much shorter than in La Mare's, and seem to begin to expand into the proper leaf. Flowers odorous, from nine to fifteen or more on a branch, growing often by threes on partial peduncles in terminal cymes, or rather corymbose panicles; filaments white; anthers yellow; peduncles smooth: bracteoles under each division of the panicle, and at the base of each flower very small, caducous. There is a variety figured by Rumphius with four larger bracteoles, which Linnæus feems to have mistaken for a second calyx, or as he calls it a perianth of the fruit placed under the germ, in contradiction to the superior perianth of the flower. Fruit coracceous, reddish brown, oval-oblong, not falling spontaneous from the tree till the ensuing year. The bark, fruit, roots, and leaves, are all more or less aromatic. A native of moist situations in the Molucca islands and New Guinea.

2. C. obtusifolia. Sonn. nov. guin. pl. 120. "Leaves ovate-oblong, obtuse. All parts of the plant scented. Leaves rounded at the summit, pale green, on long petioles; claws bitter. Sonnert's figure represents a branch with only two terminal flowers. A native of New Guinea.

Sonnert mentions another scentless species or variety differing from the preceding, in having the segments of the calyx extremely long and acute.Labourion found in Cochin-china what appears to be a still different species with scarcely any fimbri or tail, which he thus describes. A middle-sized tree with few branches. Leaves broad-lanceolate, quite entire, smooth, opposite, petioled. Flowers white; peduncles many-flowered, regular, upright, terminal; calyx tubular, oblong, four cleft; segments acute, short, somewhat upright; petals roundish, convex, small. Pericarp a calycine berry, ovate oblong, corticose, pale brown, crowned with the segments of the calyx. Seed fingle.

Ohb. The clove spice does not appear to have been known by the ancient Greeks and Romans. Dioscorides, indeed, has conjectured, and Diosenus a Stapel agrees with him in thinking, that the tender branches of this tree are the real cinnamon of the ancients; but as far as we are able to judge, the supposition is without probability. The first distinct mention of it is by Paulus Cognus, a Greek physician of the seventh century, who observes that it does not correspond with its name which seems to imply a leaf in the shape of a nut, and of which Mr. Ray long after acknowledged that he could not guess the meaning; but is properly a kind of rod-like flower, the produce of an Indian tree. He says it is of a dark colour, about the thickness of a finger in length, aromatic, acid, somewhat bitter, warm and dry in the third degree, much used, both in food and as a medicine. It was probably first brought into Greece from Arabia, as it corresponds sufficiently with the description of the Cerusel of Scarpion, an Arabian physician nearly con-

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temporary with Paulus Cognus, and of the Charneil bel-

lom of Arabia, another physician of the same country, who flourished at the beginning of the eleventh century. When the Portuguese began their troublesome intercourse with the Indian sea, about the close of the fifteenth century, they found it became feasible of the value of the clove as an article of commerce, and are said to have fown many thousand cberos in the island of Amboyna, about four years before it was taken by the Dutch. To this island and the neighbouring smaller ones of Homimba, Oma, and Nussa lat, commonly called the Spices, its new malwers, with that narrow spirit of ex-

"costly selfishness which is so generally attributed to them, as a national characteristic, have long wished to confine cultivation, that they might monopolize the sale of it to them-

selves and have it in their power to fix upon it their own price. For this purpose, about the middle of the last century they compelled the kings of Ternate, Tidore, Macahau and Bak-

chian, and afterwards made a similar contract with the king of Bontum, to accept an annual payment, as a recompense for suffering the clove-tree to be extirpated throughout their dominions, and for affording the Dutch agents in their periodical circuit of devolution. The king of Ternate is laid by Du Tour to have received annually about eighteen thousand rix-Dollars, near four thousand pounds sterling: but according to Stavorinus, the king of Bontum received lately only 170 rix-Dollars, or 321. 14s. 6d. which is represented as a considerable sum in his treasury. The Dutch East India company are also bound to take at a fixed price all the cloves raised by the inhabitants of Am-

boyna. Besides these restrictions, they have sometimes thought fit to reduce the number in the islands appropriated to their growth. In 1709 it was ordered by them that more than five hundred thousand should not be suffered to re-

main in the island of Ambon; in 1733, fifty thousand more were destroyed. But not withholding all the efforts of their illeterable policy, the clove tree is now known to grow abundantly in New Guinea and many other islands over which they have never obtained any influence, that even if there were a probability of their rising from their present degraded state, and recovering their former rank in the scale of nations, it would not be possible for them to renew so odious a monopoly. So long ago as 1770 the patriotic M. Poivre, then intendant of the Isle of Bourbon, sent two ships to the spice islands under the direction of M. Prevoil, a confidential friend well acquainted with the navigation of the coasts, for the express purpose of obtaining living plants and seeds to be cultivated in the French colonies. After several unsuccessful attempts, this able negotiator obtained from the kings of Gebi and Palam in the island of Ceram, sovereigns entirely independent of the Dutch East India company, a great number of plants both of the clove and nutmeg tree, as well as of ripe berries and nuts. In the year 1771 M. Prevoil made another voyage to Gebi and returned in 1772 with a still more abundant cargo of trees and seeds. They were planted by M. Poivre in a magnificent garden prepared for them in the Isle of France, whence they were afterwards exported in considerable quantities to Cayenne and Martinico. In Cayenne 4,400 clove trees were gradually raised between the years 1779 and 1784, exclusive of those which had been distributed among private individuals. In 1783 the eldest of them, then of six years growth, produced a few small flowers; and two pounds and a half of cloves were collected from them. In 1786 the crop amounted to 1,200 pounds; and in 1787 to 273 pounds, when Lavrinier and the Count de la Luzerne were appointed to examine them and report their quality to the French government. The cloves of Cayenne proved equal to those of the East Indies.
and were even found to afford a larger proportion of essentinal oil. In 1792 the plantation contained 4,500 fruit-bearing trees; and a merchant of Bourdeaux had sold it in the preceding year 700 pounds of Cayenne cloves at a lower price than was asked for those from the Moluccas. The success of the plants sent to Martinico was not known to Du Tour, from whom these details are taken, that island having soon afterwards surrendered to the British arms; but we learn from the translator of Stavorinus's voyages to the East Indies, that in 1797, 305 pounds of cloves were imported into the port of London from Martinico, and in 1798, 200 pounds from the same island and 581 from St. Kitts.

This spice is so much fought for in commerce, and is so much esteemed by epicures, that the ripe fruit of the plant, but the bud of the flower, which is found by experience to lose much of its aromatic quality if suffered to remain on the tree till the authors have discharged their pollen, and the germ has become impregnated. In Ambon it makes its first appearance at the beginning of the rainy season, and is of a dark green colour. In August and September it acquires its proper shape, and then gradually passes from green to yellow, and from yellow to red; but still has its flameless point in the unopened petals, which form a kind of globular button at the top of the calyx and germ. In that state it has a strong resemblance to a small nail; of which the closed petals and expanded segments of the calyx compose the head, and the germ, gradually tapering to a blunt point, the lower extremities. The resemblance is so striking, that it has given rise to the vulgar name by which this article of commerce is known in most nations of Europe. The Dutch call it naghel, the Spaniards clove, the Italians chiolo, and the French clove, from which the English word clove is evidently derived.

When the cloves have thus arrived at what may be properly called their mercantile state of maturity, those within reach are gathered by the hand, and the rest, as most authors assert, are beaten down by poles or reeds; but, according to Stavorinus, are cut off with long hooks. The latter is the more probable account; for, as Mr. Ray observes, it is not easy to conceive how unripe fruit which in a healthy state is usually strongly attached to the tree, can be forcibly beaten off, without breaking or materially bruising the tender branches, which at the same time is expressly laid to be carefully avoided, as a certain detriment to the crop of the ensuing year. The season of gathering continues from October to February. The cloves, as soon as they are gathered, are dried either in smoke over a fire, in the sun, or in a kiln. Stavorinus asserts that those which are dried in smoke are not good, and may be distinguished by their blacker colour, and their bending between the fingers: whereas those dried in the sun are of a reddish cast, and are not flexible, but brittle, snapping at once when being filipped by the finger. Du Tour observes, that the oily part of the clove is best preferred when it is dried in a kiln. Those are always preferred in the market which appear plump, and leave an oiliness on the fingers when pressed, which have most of the aromatic taste and smell, and which retain the globular unexpanded corolla, a certain proof that they have not continued too long on the tree.

They are used in their native climate, and in almost every part of the civilized world, as an article of luxury, communicating a pleasing flavour to preferred fruit, sauces, ragouts, and liqueurs. They are likewise employed by the perfumer. In medicine they are esteemed tonic, cordial, and exhilarating, acting as a powerful stimulant to the muscular fibres, and superior to most of their class in cases of alto sour, paralysis, &c. They have a strong agreeable smell, and a bitterish, hot, but not very pungent taste, qualities which are completely extracted by rectified spirit. To water they communicate more of their smell, but less of their taste; and in distillation with water, they yield one-sixth of their weight of essentinal oil, smelling strongly of cloves, but less pungent than the spirirous extract. This oil is an article of the Pharmacopoeias, and enters into several officinal compositions. It often gives infallible ease in the tooth-ache; and is used with benefit as an external application in paralytic and lachrymose affections. That which is commonly met with in the shops, and received from the Dutch, is much more aromatic than the genuine distillate oil, and is probably sophicated by an admixture with the pungent part of the cloves, from which it receives its peculiar acrimony and high colour.

Valentin describes four sorts of cloves; that which he calls the male is the fruit used for drying; the female is of a pale colour, and the bunt for extracting oil; the king's clove is a very scarce species, bearing larger and double fruit, and is perhaps that figured by Rumphius, who he calls regium; the fourth sort, or rice-cloves, are very small, and likewise very rare. Whether the trees which produce these different kinds are distinct species, or only varieties, we cannot determine.

The berries which ripen on the tree are emphatically called mother-cloves, as being chiefly destined to give birth to a future progeny. The Dutch, however, preserve them in sugar, and value them as an useful astringent to digestion, and a pleasant anticoagulant fea-flower. See Bodan's a Stapel's Notes to Theophrastus, Rali Hiltoria Plantarum, Stavorinus's Voyages to the East Indies, Sonnert's Voyage to New Guinea, Woodward's Medical Botany, La Marsh in Encyclopædia, and Du Tour in Nouveau Dictionnaire, under Epice and Geroufr. On re-considering the subject, since the article Caryophyllus was drawn up and sent to the press, we are convinced that Linnaeus was right in retaining for the Atlantic spice the name of Caryophyllus, which had been originally formed for it by the Greek merchants of the middle ages, who seem to have mistaken the dried cloves for the leaves of the plant; and that he had no alternative but to invent a new one for the European plants, which could not possibly be arranged under the same genus, although they had received the same appellation from the earlier modern botanists, on account, as Mr. Ray has observed, of some resemblance to the smell of the original caryophyllus, or clove, in one of the species at least which is still called by gardeners the clove-pink. (Dianthus caryophyllus, Linn.). He is to be cifted only for distinguishing, by the name of Caryophyllus, a natural order which does not contain the true Caryophyllus, and which he might have been led by an obvious analogy to call Dianther. It is surprising that he should have been followed by Jussieu in so gross an impropriety.

CARYOTA, Linn. See CARYUS, Mamm. See MARMOR.

CARYSTUS, in Ancient Geography, a town of Greece, in the island of Euboea, situated in the southern part of the island, at the bottom of a small gulf which opened to the south-west. It was famous for the quarries of marble which were found in mount Ocha, at the foot of which it was situated. This marble was in high estimation among the Romans. Strabo says that this high mountain furnished the well known abbeles or amanthis. Protocles calls this town Caryile, and it is said to have derived its name from Caryaus, the son of Chiron; whence it was also called Chironia; and it was likewise denominated Aegon, from Aegon, who is said to have reigned here, and is supposed by Stephanus to have given his name to the Aegonian sea. The inhabitants of Caryus worshipped the god Briareus, who, according to Homer, was the name of Aegon, adored by the Chalcidians; the name of Aegon being given to him, as he calls us, by men, and that of Briareus by the immortal gods. Caryus has been since called Calia, and Calioli. 

CARYUS, in the Materia Medica, a name given by Dioscorides, and some other of the ancient Greeks, to the eryngium, or sea-holly, called by us eryngius. It was thus named from its having a small head or cluster of flowers like a walnut. See ERYNGIUM.

CAS, St. Bay, in Geography, a bay of the English channel, on the N.W. coast of France, where in 1553 the English made an unsuccessful landing, with the loss of about 1000 men. It derives its name from that of a village near it. It is 10 miles W. of St. Malo, and 5 S.E. of cape Frehel.

CASA, John De Ia, in Biography, a celebrated Italian writer, was the descendant of a noble family at Florence, and born in 1503. Having been educated at Bologna, and afterwards having purfied his studies for some time at Florence, under Ubaldino Bandinelli, he settled at Rome, and, in 1548, became clerk of the apostolical chamber. With the elegant and classical studies to which he was devoted, he combined, as was too frequently the case, the licentious manners of the capital, and as the fruit of his amours, he CSPD.
had a natural son, whom he named Quirino. In 1540 he became a member of the newly established Florentine academy; and in 1544 he was made archbishop of Benevento, and also dispatched as nuncio to Venice. Failing to engage the Venetians to join in a league with pope Paul III. and Henry II. king of France, for controlling the(dreaded power of Charles V., which was one object of his mission; he succeeded in another, for the purpose of carrying on a procels against Vergerio, formerly the pope’s nuncio in Germany, who had become a Lutheran. But although he drove him from Italy, Vergerio amply avenged himself by the injury which he did to Cafa’s reputation in Europe. Under the pontificate of Julius III. he was involved in the disgrace of Cardinal Alexander Farnese, and obliged to quit Rome, and to retire to Venice, in the vicinity of which he passed several years in the private prosecution of his studies. Upon the election of Paul IV. he was recalled to Rome, and appointed secretary of state; but he never advanced to the rank of cardinal, which some have ascribed to the licentious writings of his youth. He died of the gout in 1556, at the age of 53 years.

John de Cafa has been always regarded as one of the politest writers of the most flourishing age of Italian literature, and one of the principal models of the pure Tuscan dialect. His verses, though defective in style, excel in elevation of sentiment and lineaments of imagery. Deviating from the course pursued by Petrarch and his imitators, he aimed at substituting a sublime and noble gravity to their perpetual softness and tenderness. He also adopted in his youth the burlesque manner of Berni, and other writers; and in this style of composition he wrote his famous “Capitol del Forno,” which, by its extreme indecency, fixed an indelible reproach on his name and character. This piece, and some more of his performances, have been superseded in all late editions of his works; but they are printed among other compositions of a similar kind by Berni, Mauro, and others, at Venice in 1538. His Italian letters are elegant, but defective in point of ease and familiarity. His most celebrated work in Italian prose is the “Galazzo,” or Art of living in the World, which is a kind of fytel of palatines, that has been much esteemed, and translated into most of the languages of Europe. His orations have been much admired, as finished pieces of artificial eloquence. As a writer of Latin in prose and verse, Cafa is one of the happiest imitators of the ancients, and his lives of the cardinals, Contarini, and Benno, are masterpieces of their kind. His knowledge of Greek was displayed by elegant translations of the orations in Thucy-dides, and of that of writer’s description of the pellicise at Athens. Of the numerous editions of his works, that of Venice in 5 vols. 4to. 1728, is reckoned the most valuable, on account of its illuminations and biographical anecdotes.


Casa, in Ancient and Middle Age Writers, is used to denote a cottage or house.

Casa Santa, denotes the chapel of the Holy Virgin at Loreto. This is properly the house, or rather chamber, in which the Blessed Virgin is said to have been born, where she was betrothed to her spouse Joseph, where the angel saluted her, the Holy Ghost overshadowed her, and, by consequence, where the Son of God was conceived, or incarnated. It is pretended to have been carried in May, 1524, through the air from Galilee to Tarsu in Dalmatia, by angels; and 45 years afterwards to have been removed to Italy, where about midnight, in December 1594, it was set down in a wood, in the district of Recanati, about a thousand paces from the sea. But it was nearly 200 years in Italy before any author of that country took any notice of it. Of this building the Catholics tell many other wonderful stories, too childish to transcribe.

The Santa Casa, or holy chamber, consists of one room, the length of which is 15 feet, the breadth 15 feet and nearly 3 inches, and the height 18 feet. Formerly it had only a timber ceiling; but, felt by a great number of lights continually burning, it should happen to take fire, Clement VII. caused a vaulted roof to be made. It was also strongly compacted with rafters, boards, and ropes, and supported by machines till the new foundation was carried up, so as to be joined with the old walls of the house. On the ceiling is painted the assumption of the Virgin Mary. On the well side of the window, through which the angel came into the house, and fucic it, in a niche, stands the image called the great Madonna, or lady, five feet high, made of cedar, and, as they say, wrought by St. Luke, who was a carver as well as a physician. The mantle or robe she has on, is covered with innumerable jewels of inestimable value. She has a triple crown of gold, enriched with pearls and diamonds, given to her by Lewis XIII. of France, and a little crown for the child Jesus. The niche in which the image stands is adorned with 71 large Bohemian topazes; and on the right side of the image is an angel of cast gold, profusely enriched with diamonds and other gems, which is said to have cost 50,000 ducats, and which was offered by Maria Beatriz Eleonora, of the house of Este, queen of king James II. of England, that, by the intercession of the Virgin Mary, she might conceive a son. Accordingly, soon after, as it is said, she had a son; who has since occasioned so much noise in Europe, under the name of the pretender to the British crown. On the left side of the Virgin’s image is a silver angel; and on the right hand another costly one, which was the gift of Lewis XIII. king of France for the birth of the dauphin, afterwards Lewis XIV. The robe which this famous image wore, when it was brought from Dalmatia into Italy, is of red camlet, and kept in a glass shrine. The dirt out of which the robe and divine infant are said to have eaten is a shallow bowl, of glazed earthen ware, plated over with silver. This utensil is not only kîted, butراری, medals, sanguis, crucifixes, and paper caps, painted with the image of the Madonna of Loreto, are rubbed against it, from a firm persuasion that they thus become an infallible remedy against the head-ache, and other diseases. Seven golden lamps are continually burning before the image; and other parts of the Cafa Santa are illuminated by 37 silver lamps, which are filled with oil out of legacies bequeathed, and ample funds established for this purpose. Notwithstanding the mean appearance of the walls within the Cafa Santa, the outside is elegantly adorned with the finest Carrara marble, which was marble was begun in 1514, in the pontificate of Leo X. and consecrated in 1535 by Paul III. The expense of this caving was enormous, and the most celebrated sculptors of the age were employed in adorning it. The arch which encloses the holy house was designed by Damaite, and the sculpture was designed and executed by the most famous artists. It was completed in 1579, and Gregory XIII. bid the honour of finishing this superb work. On the top of the Cafa Santa is a little tower, in which are hung two small bells, that are rung in violent tempests of thunder and lightning, under a notion that their sound will difperse the storm, and prevent any injurious effects. There is one part of the Cafa Santa which may be regarded as the holy of holies: for it is separated from the other part by a silver balustrade, and a gate of the same metal. It is said to be the spot where the Virgin was fitting when the angel Gabriel appeared to her at the time of the announcement. The large church in which the cafe of the Cafa Santa stands, as
if it were under a tent, is built of Ilirian stone, resembling the Trævettino stone used at Rome. The front is wholly of marble, and embellished with very fine sculpture, and over the portal is a statue of the holy Virgin. The three doors on this side of the church are bronze, with beautiful baldaquin-reliefs, representing different histories of the Old Testament. Over the middle door are these words "Domus Deipara, in quæ verbum Caro factum est." Keyler's Travels, vol. iii. See Loreto.

Casa Caldana, in Geography, a town of Italy, in the kingdom of Naples, and county of Mohits; 21 miles E. N. E. of Mohits.

Casa de la Contratarion, or the house of trade, in Commerce, a tribunal of Spain established at Seville, to the port of which the commerce of the New World was confined, as early as the year 1501, for the regulation of such commercial affairs as required the immediate and personal inspection of those appointed to superintend them. It may be considered both as a board of trade, and as a court of judicature. In the former capacity it takes cognizance of whatever relates to the intercourse of Spain with America; regulates the commodities that should be exported thither, and has the inspection of those that are received in return. It decides concerning the departure of the fleets for the West Indies; the freight or burden of the ships, their equipment, and their dilution. In the latter capacity it judges with regard to every question, civil, commercial, and criminal, arising in consequence of the transactions of Spain with America; and in both these departments, its decisions are exempted from the review of any court but that of the Council of the Indies, which fee.

Casa Grand, in Geography, a town of North America, in the country of New Mexico, and province of New Navarre, seated on a river N. of Buenaventura. N. lat. 29° 30', W. long. 107° 20'.

Casa Magdala, a town of Naples, in the country of Baris; 17 miles S.W. of Converfarno.

Casa Villari, a town of Naples, in the country of Lavara; 7 miles S.E. of Soran.

Cass, or Cazac, a country of Asia, in the dominions of Persia, on the frontiers of Armenia, governed by princes of its own, nominally subject to Persia; about five leagues from north to south, and somewhat more from east to west. The inhabitants are divided into the Caspian and Cascafs, and are reckoned a rude and barbarous people. Cacac, or Casac Loros, is the name of the capital.

Cassaggi, in Ancient Geography, a town of Asia, situate on the mountains of Pamphylia. Ptolemy.

Casa Bajdaios, or Calaenaios, an episcopal see of Africa, in Numidia.—C. Calabinti, a place of Africa, in Mauritania Tauritensis, between the colonies of Tipasa and Fesfum, according to the Itinerary of Antonine.—C. Derejaig, an episcopal city of Africa; but the province in which it was situated is not ascertained.—C. Melchaefer, an episcopal city of Africa, in Numidia. C. Nigres, an episcopal city of Numidia.—C. Sybaris, an episcopal city of Africa, in Byzacium.—C. Villa Aurea, a place of Africa, according to the Itinerary of Antonine, in the route from Carthage to Leptis, between Tceepsa and the colony of Sarcarsa.

CASCADE, in Geography, a town of Italy, and capital of Mantua, seated on the Po, formerly well fortified, and defended by a citadel, which was much admired. It was taken from the Spaniards in 1649; sold by the duke of Mantua to the king of France in 1681; taken in 1685 by the French, who destroyed its fortifications; but retaken by the French and refortified. The king of Sardinia became master of it in 1766; but it was taken by the French in 1777, retaken in 1796, and captured again by the French in 1797. The bishop is suffragan to the archbishop of Milan. N. lat. 45° 7', E. long. 9° 17'.

Casa—Magrana, a town of Italy, in the duchy of Milan, and county of the Campas, seated near the Po, and made a town in 1754. N. lat. 45° 7', E. long. 9° 17'.

CasaMacha. See Litern.

Casa Nova, a considerable town of Naples, in the province of Terra di Lavoro, containing about 2000 inhabitants; noted for nothing but its table for deer's bolts. At this place, as well as at Cece, the Custom-house and ten their hides into an imitation of Turkey leather, with which they supply the gentlemen of the neighbourhood who are nice in their dress. This demand for Cordero occasioned the slaughter of many dogs, and, without doubt, the custom of eating their flesh commenced among the needy sufferers. Hunger and experience have taught their countrymen to consider the discovery as a very beneficial one. N. lat. 40° 4', E. long. 15° 56'—Alfo, a town of Naples, in the province of Principato Città, N. E. of Pobaliron. N. lat. 40° 16', E. long. 15° 34'.

CasaLus Sitios, in Ancient Geography, a gulf on the western coast of the island of Corfu.

CasaMara, a town of Asia, placed by Ptolemy in the Palmyrene territory, which was a country of Syria. The Notitia Imperii places it in Phcenicia. It was situated on a small river to the east of Carma.

CasaMAN, a town of Asia, probably towards Armenia.

CasaMARRI, a people placed by Pliny in Ethiopia, near Egypt.

CasaN, or Kazan, in Geography, a government of Russia in Europe, seated on the river Volga; bounded on the north by that of Viatka, on the east by the governments of Perm and Ufa, on the south by that of Simbirsk, and on the west by that of Neftten Novgorod. It contains 13 districts, of which one is Cahan, or Kazan, situate on the rivulet Cazanka, which falls into the Volga. Its capital bears the same name. The kingdom of Kazan was conquered by the Tartars by Joan Vaflievitch 11. or Batilo-witz, after a service of seven years; the capital of it surrendering to the victor in 1552; and at this time the empire of it was united to Russia for ever. In the Turkish and Tartarian language, Kazan signifies a large cauldron, of sufficient size to contain victuals for many persons; and this name is given by the Crim or Kairidzhi Murics to the families of their subjects, or valets, reckoning about ten to a kazan. The present Kazan Tartars are but a feeble remnant of what they once were—the very confiding of those who remained in their old habitations, and partly of those who settled as fugitives in other districts of Russia.

CasaN, or Kazan, a city of Russia, and the capital of the above government, situated near the Volga. This city was built in the year 1537, by a son of Basy, a kinfman of the great Tchinghis; and its kharar provided its independence about the year 1441, when the Krim disjouined itself from Kazaksheh, or Capellac. Kazan consists of a strong fort, built with stone, the wooden town as it is called, and several adjoining suburbs, one of which is inhabited by Tartars. Here are several churches, most of which are constructed with stone, and also 10 convents in or near the town. The government chancery which is held in the fort, is under the direction of the governor and deputy governor. All the garrisons and regiments within the government of Kazan are under the command of the governor. The garrison of the city consists of three regiments, for the service of which a good hospital is provided. Kazan is an arch-
archbishop's fee. At one end of the town is a manufacture of cloth, which is purchased by government for the clothing of the troops. In a convent, called Siliandouo, seated on the river Casanka, about two miles from the town, is a school, where the children of Tartars are taught the Russian and Latin languages, the principles of the Christian religion, and the elements of philosophy, in order to qualify them as preachers for the conversion of the nations to which they belong. In 1749, and again in 1752, this city was totally destroyed by fire. The adjoining country is fertile in all kinds of fruits, corn, and pulse. The commerce of this government consists of furs, and oak timber for the building of ships. For the prosecution of the large oak-trees that grow in this district Peter I. appointed foresters, who had under them discharged soldiers; but these people committed every kind of excess among the inhabitants, and, therefore, they were abolished in the year 1762. However, every landowner is careful of his oaks, as they fetch at all times a good price. In Petersburg every pool of oak timber, including the expense of transport, sells for 15 to 25 kopeeks. Casan or Kazan is distant 400 miles E. of Moscow, and 660 S.E. of Petersburg. N. lat. 52° 43' 58". E. long. 59° 8' 14".

CASANDRA, in Ancient Geography, an island placed by Pliny in the Persian gulf over against Peria Propria.

CASA-NOVA, Marc-Antonio, in Biography, called in his time, the prince of Latin epicormatists, was born at Rome, where he flourished in the beginning of the 17th century. Attaching himself to the imitation of Catullus and Martial, he affected the wit and severity of the latter, but deviated from the nature and purity of the former. Whilst he was engaged in the service of the Colonna family, he excercised his fatire against Clement VII, with so little moderation, that he was imprisoned and condemned to death, but pardoned by the pontiff. After the fall of Rome he was reduced to such extreme indigence, that he wandered about the streets begging bread, and died either of want or of the plague in 1727. Besides his epigrams, he wrote short allegories or interlusions on the principal characters of ancient Rome. A selection of his pieces may be found in the first volume of the "Dithicer Poetar. Italor."

CASAPE, in Ancient Geography, a town of Africa, placed by Ptolemy in the interior of Hircania.

CASAQUE, an ancient military habit considerably larger than an ordinary coat. It was formerly the common vestment or garment of all the French. And as this caque was of a different colour in each company of their troops, it was easily and immediately discovered by this distinguishing difference, to what company any soldier belonged, who had been guilty of any disorder, outrage, or irregularity. When the caque was abolished, it was succeeded by the echarpe or scarf, which was also of different colours in different companies.

CASAS, De Las, Bartholomew, in Biography, a prelate eminently distinguished by his humanity, was born at Seville in 1474, and in his 89th year accompanied his father, who failed to the West Indies with Columbus. On his return to Spain after an absence of five years, he pursued his studies, and entered into the ecclesiastical order. When Columbus made his second voyage to Hispaniola, Las Casas was one of the clerics who attended him thither, with a view of settling in that island. On the reduction of Cuba, he was obliged to take the rector of Zaguarama in this island. Adopting the opinion which was prevalent at this time among the ecclesiastics, and particularly among the Dominicans, that it was unlawful to reduce the natives to servitude, he concurred with them in exclaiming against the "repartimientos," or distributions which were made of them by the governor as slaves to their conquerors. In order to demonstrate the sincerity of his conviction, he relinquished his share in the distribution, declaring that he should ever bewail his own misfortune and guilt, in having excercised for a moment this impious dominion over his fellow creatures. From that time he became the avowed patron of the Indians, and by his active interposition in their favour contributed to restrain the excesses of his countrymen. Actuated by a laudable zeal in their cause, he set out for Spain in 1516, for the purpose of stating their distressed situation to king Ferdinand and intreating his compassion in their favour. This monarch, being in a declining state of health, was much impressed by the eloquence of Las Casas, and promised to adopt means for redressing the evil of which he complained and the guilt of which he forcibly charged on Ferdinand himself. Death, however, prevented him from executing his resolution. Las Casas, with unabated ardour, determined to try his cause before Charles of Austria, who was then in the Low Countries, but whilst he was preparing to set out for Flanders, the regent, Cardinal Ximenes, with the vigour peculiar to his character, adopted a plan for accomplishing the object which the benevolent xeclesiastic had in view; and accordingly he resolved to send out three reputable commissioners, with ample powers to examine all circumstances upon the spot, and to decide finally with respect to the point in question. As the Dominicans and Franciscans had already espoused opposite opinions in this controversy, he excluded both these fraternities from the commission, and refuffed his choice to the monks of St. Jerome. Having selected three persons, whom he deemed equal to the charge, and joined to them a private lawyer of distinguished probity, Las Casas was appointed to accompany them, with the title of "Protector of the Indians." Upon their arrival at St. Domingo, they began to extort their commissio by liberating all the Indians, who had been granted to the Spanish courtiers, or to any person not residing in America. This measure excited a general alarm; but the fathers of St. Jerome proceeded with prudence and caution; and finding it necessary to tolerate the "repartimientos," they used their utmost endeavours to prevent the injurious effects of this establishment, and to secure to the Indians the best treatment that was compatible with their state of servitude. For this purpose they enacted several useful regulations. Las Casas, however, was dissatisfied, and remonstrated against that unhallowed timid policy, which led them to accommodate their conduct to the state of the colony, and to tolerate what was unjust, because it was beneficial. The commissioners adhered to their system; and Las Casas, in order to avoid the effects of the relentment which he had excited among the Spanish planters, was under a necessity of seeking an asylum in a convent. Receiving that all his efforts in America were fruitless, he set out for Europe, with a fixed purpose not to abandon the protection of a people whom he deemed to be cruelly oppressed. Upon his arrival, he found Ximenes dying; and soon after Charles V. took possession of the Spanish government, which he chiefly committed to his Flemish ministers. Las Casas interceded them in his cause, and induced them to recall the fathers of St. Jerome, and to appoint a chief judge to re-examine the points of controversy between the friends of Indian liberty, and the colonists. Whilst Las Casas was thus zealously promoting a scheme, supported by humanity and a liberal policy, for the emancipation of Indian slaves, he was betrayed by the ardour with which he prosecuted his purposes into the inconsistency of extending the miseries of servitude to the inhabitants of Africa. Accordingly,
accordingly, in order to furnish the Spanish planters with labourers, instead of those Indians whom he wished to emancipate, he proposed to purchase a sufficient number of negroes from the Portuguese settlements on the coast of Africa, and to transport them to America, that they might be employed as slaves in working the mines, and cultivating the ground. Thus, while he continued earnestly for the liberty of the people born in one quarter of the globe, he laboured to enslave the inhabitants of another region; and in the warmth of his zeal to save the Americans from the yoke, pronounced it to be lawful and expedient to impose a still heavier yoke on the Africans. Fortunately for the latter, Las Casas's plan was adopted. Charles V. granted a patent to one of his Flemish favourites, containing an exclusive right of importing 4,000 negroes into America. He sold his patent to some Genevo merchants for 25,000 ducats, and they were the first who brought into a regular form that execrable commerce for slaves between Africa and America, which has since been carried to such an amazing extent. Las Casas, however, connected with his very censurable plan of enslaveing the Africans the most lefK exceptable project of supplying the new settlements in Hispaniola and the other islands with a sufficient number of labourers and husbandsmen, who should be allowed by feasible pre- missions to remove thither. This scheme was countenanced by the Flemish ministers, but defeated by the bishop of Burgos, who thwarted all the projects of Las Casas. Las Casas, defparing of procuring any relief for the Indians in those places where the Spaniards were already settled, formed an idea of establishing a new colony; and with this view, he applied for a grant of the unoccupied country, stretching along the sea-coast from the gulf of Paria to the western frontier of that province now known by the name of Santa Martha. He proposed to settle there with a colony composed of husbandsmen, labourers, and ecclesiastics. He engaged, in the space of two years, to civilize 10,000 of the natives, and to instruct them so thoroughly in the arts of social life, that, from the fruits of their industry, an annual revenue of 15,000 ducats should arise to the king; and in 10 years he expected that his improvement would be so far advanced as to yield annually 60,000 ducats. In forming this scheme Las Casas had evidently conceived ideas concerning the method of treating the Indians, similar to those by which the Jesuits afterwards carried on their great operations in another part of the same continent. After encountering much opposition from the bishop of Burgos and the council of the Indies, he at length obtained a territory of 300 miles along the coast of Cumaná, with liberty to extend it as far as he pleased towards the interior part of the country. However, with all his efforts, he could not prevail on more than 200 persons to accompany him, with whom he sailed, in 1551. Several of these died or left him at Porto Rico, where he first landed: and with the few that adhered to him, he proceeded to Cumaná, which he found much disturbed on account of a recent invasion of the Spaniards. He was therefore under a necessity of repairing to Hispaniola in order to solicit succours; but during his absence, the natives, exasperated by the injuries they had suffered, attacked the enfeebled colonists, destroyed many of them, and obliged the rest to take refuge in the island of Cubagun. Soon after this island was abandoned, and not a Spaniard remained in any part of the continent, or adjacent islands, from the gulf of Paria to the borders of Darien. Las Casas, ashamed to chew himself after such a succession of disasters, and after this fatal termination of all his splendid schemes, flung himself up in the convent of the Dominicans at St. Domingo, where he resumed the habit of the order and devoted himself to the performance of religious duties. Frustrated in all his projects for the benefit of the oppressed Indians, he nevertheless not only retained his former anxiety and zeal for their relief, but an increased knowledge of their sufferings had augmented his ardour. In 1572, he was sent by a chapter of his order to Chiapa to Madrid, and he took this occasion of pleading their cause before Charles V. and ventilating his favourite maxims concerning the proper mode of treating them. Not considering for success in the powers of his oratory alone, he enforced them by computing his famous tracts entitled "Dictio Relation de la Destructior des Indes," in which he related, with many lurid circumstances, probably exaggerated by his powers of description, the devastation of every province, which had been visited by the Spaniards. This treatise excited throughout Europe a detestation of the cruelties practiced by the Spaniards in America; and Las Casas so far succeeded with the Spanish court, as to induce them to adopt several new regulations which he proposed, and which contributed in a considerable degree to alleviate the sufferings of the oppressed natives. With a view to their further relief and protection he accepted the dignity of bishop of Chiapa, and returned thither in 1544. Having continued in his see till the year 1551, he left it on account of his declining health, resuming his historic into the hands of the pope, and retired to Madrid, where he finished his course of active and indefatigable benevolence in 1576, at the advanced age of 92 years. Besides his work on the destruction of the Indians, he wrote a Latin treatise on the question, "Whether sovereigns may in conscience, by virtue of any right, alienate their subjects from their crown, and transfer them to the dominion of any other lord?" Tubing. 1625, 4to.

In this treatise he discusses, with singular freedom, many points of a delicate nature respecting the rights of sovereigns and people. He also composed many other works, which have never been published, among which is "A General History of the Indies," of which Antonio de Herrera is said to have availed himself in the compilation of his history. Moret. Robertson's Hist. of America, vol. i. and vol. iii.

CASASA, or CaSaCa, in Geography, a sea-port town of Africa, in the kingdom of Fez, at the mouth of a large river in the Mediterranean; 18 miles S. of Mechila. N. lat. 32° 8'. E. long. 32° 41'.

CASATI, PAUL, in Biography, a learned Jesuit, was born at Padua in 1517, and became a professor of mathematics and theology at Rome. He was one of the two Jesuits who attended Christina queen of Sweden at her request, and professed her to the Roman Catholic religion. Upon his return to Italy, in 1532, he was superior over several houses of his order, and occupied the first dignity in the university of Parma for two years; in which city he died in 1577. He composed the following works: "Vacuum proscriptum," "Terra machinis motis," "Fabrica et ufo del compasso di propertione," "Mechanici libri viii;" "De Ignis," "Hydrostaticae differtationes;" "Opticae disputationes," written at 85 years of age, after he was blind: "Problematum ab anno. geom. Lud. Batav. propoli posit," a Paulo Caffaro expicata."

CASaubon, ISAAC, an eminently learned critic and commentator, was born in 1559, at Geneva, whither his father retired to escape persecution, and received his early education at Creil in Dauphiné, under his father, where he was settled as minifter, when the persecution ceased. So rapid was his proficiency, that, at the age of nine years, he was
was able to speak and write Latin with facility and correctness. But, on account of his father's frequent absence, he did not follow the ground which he had gained, that, at the age of 12 years, he was obliged to recommence his studies. In 1578, he went to Geneva, where he made such progress in the Greek tongue under Francis Portius of the isle of Candy, the Greek professor, that, in 1582, he was appointed to succeed him. At the age of 25 years he published his "Diogenez Laertius," which were added, in 1584, to the 5to. edition of Henry Stephens. His "Lettera Tionon Thocritus," were published at Geneva in 1581, 12mo. and dedicated to H. Stephens, whose daughter he married in 1586, by whom he had 20 children. These notes were likewise published under the assumed name of " Horatius," synonymously with Cafauboni, because Cafa, in Dauphine, means a garden; which he preferred to his own as more suitable to a Latin book. In 1587, he published his "Strabo" at Geneva, fol.; and in the same year his edition of the New Testament with notes, afterwards inserted in the "Critici Sacri." Having studied philosophy and civil law under Julius Paccius, he also applied to the oriental languages and Rabbins. His notes on " Dionysius Halicarnassensis," were published at Geneva, in 1588, fol.; and his " Polyphemus Stragatagem.," at Lyons, in 1589, 12mo. His "Ariosto," in Greek and Latin, was printed at Lyons, in 1590, and reprinted at Geneva, in 1603, fol.; and in the following year he published an edition of "Pliny's Letters," with notes, and the ancient "Panegyrics," Geneva, 12mo. His " Theophrastus' Characters," 12mo. was published at Lyons, in 1592, with a Latin version and commentary, and a third more correct edition appeared at Lyons, in 1611, 12mo. His "Apuleius' Apology," appeared in 1594, 4to. dedicated to Joseph Scaliger; and his "Commentary on Suetonius," was printed at Geneva, in 1596, 4to. and another enlarged and corrected edition was printed at Paris, in 1610, fol. Dissatisfied with his situation at Geneva, he removed to Montpellier, in 1596, and accepted the office of professor of the Greek and of polite literature; but here he was so much disappointed in his expectations of encouragement and support, that he thought of returning again to Geneva. However, in 1598, he removed to Lyons, with the view of printing his edition of "Athenaeus' Deipnosophistae," which was published in 1598, and again in 1613, in 2 vols. fol.; and in the mean while he accompanied M. du Vieux to Paris, where he was introduced to king Henry IV. and whose invitation to the office of professor of polite learning he accepted, in 1599. But jealousy, on the part of the other professors, and his own adherence to the Protestant religion, rendered this office untenable. In 1600, he was one of the judges on the side of the Protestants at the conference held at Fontainbleau, between Cardinal du Perron and du Plessis-Mornay, and by his conduct on this occasion he led some perfons to expect that he would become a convert to popery; but though he was no zealot in religion, he invariably declined complying with the solicitations of his Roman Catholic friends, who wished him to change his profession. The king, who had conferred upon him a pension, promised him also the reversion of the post of his librarian, which office he obtained in 1603, together with an increase of his pension. At this time he published several works of the ancients, viz. " Historia Augusti Scriptores cum Commentario," Paris, 1597, 4to.; " Diatriba ad D. Chrysolomini Orationes," published in Morel's edition of that author at Paris, 1604, fol.; " Perii Satriae ex recensione et cum Commentariis J. Cafauboni," Paris, 1605, 8vo., and London, 1647, 8vo. of which Joseph Scaliger says, that in this edition "the fauce is worth more than the filth."" "De Satyrich Gospelium Poëth. et Romanorum Satyri, lib. ii." Paris, 1605, 8vo.: in which work he maintains that the satirical poetry of the Latins was very different from that of the Greeks; an opinion which was attacked by Daniel Heinsius, and vindicated by Eckfeld Spanheim; and "De Esuli Epitola ad Epitaphium, Ambrosian, et Daliliani, Gr. et Lat. cum notis J. Cafauboni," Paris, 1664, 8vo. and Hanau, 1611, 8vo.; which letter was first published by him. In 1667, he composed his treatise "De Libertate Ecclesiastic," 8vo.; which was occasioned by the disputes that had occurred between pope Paul V. and the republic of Venice, and contains a vindication of the rights of the Romish see against the pretensions of Rome; but these disputes being adjusted whilst the work was printing, it was suppressed by order of king Henry IV. His edition of "Polybius," to which is annexed "Épites des tacles de toleranda obidiones, Gr. et Lat," was published at Paris in 1609, fol. His Latin version of both these authors was much approved; and the dedication to Henry IV. is reckoned among the masterpieces of modern Latin composition. The best edition of his letters "If. Cafauboni Epistola, &c." containing all his prefaces, dedications, poems, &c. with those of his son Merci, is that by Almeoven, Rotterdam, 1709, fol. In consequence of several controversies which he held with cardinal du Perron on the subject of religion, a report was spread that he had promised to abandon the Protestant faith, which he thought it necessary publicly to contradict: and his uniform adherence to his profession sufficiently refutes the charge of indifference to religious doctrines, which has been alleged against him. Although he was perpetually in his attachment to his own profession, he avoided controversy, and in his opinion, with regard to those who differed from him, he was liberal and tolerant. When one of his foes became a capuchin, and afterwards fought his blessing, "I give it you," says he, "with all my heart; I do not condemn you, neither do you condemn me: we shall both appear at the tribunal of Christ." As a farther evidence of the liberality of his sentiments, and love of peace, it is alleged, that he was one of those who thought an union between the Papists and Protestants to be both practicable and desirable; and in this opinion he concurred with the learned Grotius and many others of the age in which he lived. His attachment to his own profession, notwithstanding his liberality, was evinced by the uneasiness he felt on occasion of his eldest son's becoming a profyte to the Catholic religion. After the death of Henry IV., an event which he much lamented, he determined to comply with the repeated invitation of James I. to visit England; and, accordingly, in 1610, he accompanied Sir Henry Wotton bishop, and was received with great civility by the king and many other persons of learning and distinction. Upon his arrival, he was made a denizen, liberally pensioned, and presented to a prebend at Westminster and another at Canterbury. In return for these favours he was engaged by the king, much against his own inclination, in controversial writings against the Papists. Accordingly, his translation of Baronius' Annals, or "Exercitationes contra Baronium," was published at London, in 1614, fol. at Frankfort, in 1615, 4to. and at Geneva in 1655 and 1663, 4to. He did not live long after the completion of this work; for he died of a singular and painful disease of the bladder, of which his Theodore Maircer has given a particular account in his medical writings, in 1614, in the 55th year of his age. He was interred in Westminster Abbey, and a handsome monument was erected to his memory by Thomas Morton, bishop
of Durham. The laudatory epitaph, inscribed upon it, reads:

"Qui mole vult Cæsaranum,\nNon fundit, sed chartas legat,\nSuperfatas manum,\nEt profuturas polles."

Casaubon's character was that of a model, studious, upright man, though somewhat reticent and quiescent in his temper. As a critic, he is always ranked among the first, and his numerous publications, the principal of which we have recounted, afford sufficient evidence of his indefatigable industry and extensive erudition. Gen. Dict. Biog. Brit.

CASAUBON, Music, son of Isaac, the subject of the preceding article, was born at Geneva in 1599, and, accompanying his father to England, in 1610, finished his education at Chirill-church college, Oxford, where he took the degree of M.A. in 1621, and acquired the reputation of extensive learning. At the age of 23, he published a book, vindicating his father against the calumnies of the Roman Catholics, and entitled "Pietas contra maloedicis Patrii Nomini et Religionis Holi," 8vo. This was followed, three years after, viz. in 1624, by a second vindication of his father, "Vindicatio Patris adversus Impolones, &c." written by command of King James I. and occasioned by a publication of the same year, entitled, "The Original of Idolatries, or the Birth of Heresies, &c." falsely ascribed to I. Casaubon. About this time he was promoted to the rectory of Bleton in Somersetshire; and, in 1628, by the interceding and recommendation of Bishop Laud, he was made prebendary of Canterbury. This prelate, upon his own advancement to the see of Canterbury, gave Casaubon two vicarages in the Isle of Thanet; and, in 1636, he was created doctor in divinity by mandate of King Charles I.; but, during the heat of the civil wars, about the year 1644, he was deprived of his preferments, fined, imprisoned, and reduced to extreme indigence. In these circumstances he declined accepting some advantageous offers that were made him in 1649, on condition of his undertaking to write the history of the late war; and he also rejected an invitation that was conveyed to him soon after by the Swedish ambassador from queen Christina, to superintend the universities in her kingdom. On the restoration he recovered his preferments, and, in 1662, exchanged one of his vicarages for the rectory of Eekmam near Canterbury. He died in 1671, and was buried in the cathedral of that city. His literary character was that of a general scholar, but by the aid of his father's rules and papers more skilful in criticism than in any other department of literature. In private life he was distinguished by his piety and charity, and by the courteousness of his disposition and manners. Of his publications the principal are as follows: viz. "Opuscula Libri VII. de Scholasticae Dominantia," 1635, 8vo.; "A Treatise of Use and Custom," Lond. 1635, 8vo.; "The Life of Daily Public Prayers in Three Parts," Lond. 1634, 4to.; "Marci Antonini Imperat. de feipso et ad ejusdem, &c. with Xylander's Version, &c. &c." Lond. 1643, 8vo.; also, "An English Translation of this Work, with Notes, &c." 1634.; "De Verborum Ue, et accurate eorum Cognitionis Utissimae Dissertatio," Lond. 1647, 5vo.; "De quatuor Linguis Commentationes, Pars I." comprehending the Hebrew and Saxon, but left incomplete as to the Greek and Latin; Lond. 1672, 8vo.; "Terentiae, cum Notis T. Farinabili in quattuor priores comedias, et M. Caasab. in Pharnaceum et Hecyram," Lond. 1671, 12mo.; "Some Annotations on the Psalms and Proverbs," inserted in one of the latter editions of the "Afflictabi's Annotations on the Bible;"

In Hierochis Commentarium de Providentia et Fato, Note Vot. VI. of Emendationes," Lond. 1644, 8vo. and 1651, 4to.; "A Treatise concerning Entusiasms, as it is an effect of Nature, but is mistaken by many for either Divine Inspiration, or Diabolical Possession," Lond. 1655, 8vo.; a work highly commended by Sir William Temple, as a happy attempt to account for delusions upon natural principles, though it has been observed, that the author was too much inclined to credulity and superstition to discuss the subject philosophically, which appears from his "True and Faithful Relation of what passed for many years between Dr. John Dee and some Spirits," in the preface to which he attempts to confirm what is said in that relation concerning spirits, Lond. 1670, fol.; and also in his work "Of Credulity and Incredibility in Things Natural, Civil, and Divine; wherein the Sadducism of these Times in denying Spirits, Witcheries, and Supernatural Operations, is fully confuted," &c. Lond. 1698, 8vo. 1672, 8vo. 1672; "De Nupera Homeri Editori Commentario Langianno-Hastievi HACKNAM, &c." Lond. 1679, 8vo. reprinted in Almavovea's edition of Casaubon's letters; "Epistola Exceptionis et Cebetis Tabula, Gr. & Lat." Lond. 1679, 8vo.; "An English Translation of Lucius Florus's History of the Romans, with Notes," Lond. 1679, 4to.; "A Vindication of the Lord's Prayer, &c." Lond. 1660; "Note et Emendations in Doigenem Laertium, &c." annexed to the editions of Laertius, printed in Lond. 1664, fol. and Amt. 1692, 4to.; "Of the Needesse of Reformation in and befor Luther's Time, &c." Lond. 1664, 4to.; "Note in Pidemur," first printed in Graumvius's edition, Amtl. 1670, 8vo.; and "Epistle, Dedicationes, &c." annexed to I. Casaubon's letters by Molnover." Besides the works above recited, M. Casaubon wrote several other pieces, learned, controversial, &c. which it is needless to enumerate. He also left, by will, a great number of MSS. to the university of Oxford. His English style is harsh and perplexed, and much intermixed, according to the custom of the time, with Greek and Latin. Gen. Dict. Biog. Brit.

CASAVOLI, in Geography, a town of Naples, in the province of Bari; 14 miles S.W. of Monopoli.

CASKA, a town of Africa, in the kingdom of Tunis, which was once a Roman colony, is situated on a large, fertile plain, about 25 or 30 miles S. of Tunis. The walls of this town are still standing, though it has been almost destitute of inhabitants ever since it was destroyed by the Turks.

CASKIA, in Ancient Geography, a town of Asia Minor, in Lycaonia. Ptolemy.

CASBVIN, in Geography, a city of Peris, in the province of Irak Ageni, is situated in an extensive pleasant plain, about 3 leagues from the noted mountains of Alaved or Elwend. It was formerly a very considerable city, being about nine miles in circumference, and containing 12,000 houses, occupied by 100,000 inhabitants; but it has been so reduced by the civil wars of the country, that, in Hasaway's time, its civil and military towns did not exceed 1,100. Its beautiful palaces are now in ruins, its walls are destroyed, and it has neither garrison nor forts to defend it. The Hippodrome, or Royal Piazza, was 700 paces long, and 250 broad. Its situation for commerce in many respects, advantages, as it lies open to Georgi, Adarbeizan, and the Caspian sea. Its adjacent territory produces excellent grapes, some of which yield a strong wine, and others are dried, and sent with other fruits to all the provinces of the country. In its vicinity are found yellow orpine and copper ore. In the 18th century Shah Tahmas, unable to defend Tunis against the Turks, retired to Casbin, which he established as the capital city of his empire; but Abas the Great transferred this dignity to Isphahan. The European geographers allur...
that Caucas is the ancient Arfaria; but the Persian historians will not allow it to be so ancient. N. lat. 36° 3′. E. long. 49° 33′.

CASBUONA, a town of Naples, in the province of Calabria Citera; 5 miles W. of Strongoli.

CASCADE, the hindermost part of the breech of a cannon from the base-ring to the cap or extremity of the knob or button. See CANNON.

CASCADE, a deep fall of water, from a higher into a lower place.

The word is French, formed of the Italian cascata, which signifies the name of a cascade, or falls, and that from the Latin cadere.

Cascades are either natural, as that of Tivoli, &c. or artificial, as those of Verfallies, &c. and either falling with a gentle descent, as those of the Senaun; in form of a buffet, as at Trianon; or down steps, in form of a person, as at St. Clou; or from bason to bason, &c.

A natural cascade, falling with a great noise, is more properly called a cataract, which fee.

In a military sense cascade signifies, in hollowing out, or digging galleries or mines, a sinking down into the earth by a fort of rep below the common level, or a raising above the figure in like manner. When a miner rather sinks deeper into the ground or rises up higher by means of such repus at different distances, or turns, he is said to proceed by cascades, or to ennemen par cascades.

CASCADE of fire. See PYROTECHNY.

CASCADE point, in Geography, a cape on the western coast of New Zealand, in the South Pacific ocean. S. lat. 44° 5′. E. long. 159° 4′.

CASCAES, a sea port town of Portugal, on the N. side of the mouth of the Tagus, situated on a slip of land under which ships lie; 5 leagues W. of Lisbon. N. lat. 38° 44′. W. long. 9° 33′. Cape Cascas lies 2½ miles S.W. of the town.

CASCANS, in French corses, holes sunk in the ground in the form of pits or wells, near the ramparts, from which galleries are carried under ground, either to mines of your own, or to give vent to those of the enemy. Caercans also denote a kind of cellars made under the capitals of a fortification.

CASCANTE, in Geography, a small town of Spain in Navarre; 2 leagues from Tudela. Its ancient name was Caecanum, and it was a municipal town. Ptolomy attributes it to the Viscun. It was situated near the Iberus; S.E. of Calagris.

CASCARILLA, in Botany. See CROTON CAFOARILIA.

CASCARILLA, in the Materia Medica, is placed by Dr. Cullen in the class of terebinths. It approaches, he says, to the aromatic by its essential oil; but its bitter, to be extracted either by water or spirit, is its most considerable part. It was introduced in the 17th century as a medicine of great value, both in continued and intermittent fevers; and the Italians, fond of any thing as a substitute for the Peruvian bark, against which they had declaimed, employed the cascarilla in their practice and added many testimonies of its efficacy: but these testimonies have not been supported by succeeding practitioners, and in this country particularly it has been found a weak substitute for the Peruvian bark. In several trials it has entirely failed. Bergius, though he affirms its inefficacy in fevers, recommends it in hemoptysis. But Dr. Cullen observes, that in hemorrhages of all kinds it seems to be rather hurtful, as might be inferred from its aromatic and bitter qualities, while it does not in any instance manifest an astringent power. Its tonic and stimulative power may be allowed; but in these respects its virtues are not peculiar nor considerable: nor is there any just foundation for the prejudices which the German physicians have conceived in its favour. Cullen, Med. vol. II. p. 89. It has however, maintained its place in our Pharmacopoeia. The extract of cascarilla, prepared in the same manner with that of Cinchona (which fee), has been lately introduced into the London Dispensatory, as a medicine of considerable use, and serving as a tonic in dyspepsia, debility of bowels, and in some circumstances of epidemic fevers. It may be given from 10 to 20 grains, two or three times a day. The tincture of cascarilla, prepared by digesting four ounces of powdered cascarilla in two parts of proof spirit of wine with a gentle heat for eight days, and straining it, is given in debility of the stomach and bowels, and may be sublimated in some cases for the tincture of cinchona.

CASCE, CASCA, or CASCIE, in Ancient Geography, a town of Asia in Aria. Peloponnes.

CASCHARA, a town of Asia, in Mesopotamia, garnished by the Romans to guard their frontiers.

CASCAU, CASSCIA, KASSE, or KASSICHE, in Geography, the capital of Upper Hungary, a royal free town seated on the river Hernath, or Hundert, surrounded with a triple wall, a moat, and a bulwark, and furnished with a good arsenal. It is a well built place and the seat of a tribunal. The wine, beer, and ale of this town are very bad. In 1510 it was besieged in vain by the Poles. In 1535 king Sigismund besieged it by Bretagem, and in 1556, it was destroyed by fire. In 1614, its large and beautiful parish church was taken from the Lutherans, upon which, and in consequence of other oppressive measures, the Caeschians were so incensed that they took part with Stephen Bottfay, who died here in 1656. In 1661, it surrendered to Bethlem Gabor; in 1644, to George Rakotzy; in 1681 to Tokoly; and in 1685, to the Imperialists. Its university was suppressed in 1782. It is distant 100 miles S. from Cracow, and 124 N.W. from Claustenburg.

CASCHIVE, (Mormyrus Caschive), in Ichthyology, the name under which Haseliquint describes the Linnaean Mormyrus anguillitus, which fee.

CASCHOU, in Botany, Merian, Surin. See Anacardium occidentale.

CASCO-BAY, in Geography, a bay of North America, in the district of Maine, which spreads N.W. between Cape Elizabeth on the S.W. and Cape Small on the N.E. Within these points, which are about 45 miles apart, are about 300 small islands, some of which are inhabited, and almost all more or less cultivated. The land in these islands, and on the opposite coast on the main, is the belt for agriculture on the sea-coast of this country. Casco includes several bays. Mount Bay lies about 20 miles N. of Cape Elizabeth. On the E. side of this cape is the arm of the sea called Stroudwater. Farther to the E. is Presumpscot river, formerly called Pufumpac, or Pufumpkeag, which rises in Saco pond. This river opens to the waters of Casco-bay on the E. of Portland, and upon it are several valuable mills. Royal's river, called by the natives Weskecutego, falls into the bay six miles from Presumpscot river. It has a good harbour at its mouth for small vessels; and it has upon it several mills; but two miles higher a fall obstructs the navigation. Between it and Kennebeck there are no rivers: some creeks and harbours of Casco-bay extend into the main land, affording harbours for small vessels, and interfacing the country in various forms. N. lat. 43° 40′. W. long. 70° 10′.

CASCUMPAC Harbour lies on the North coast of the island of St. John in North America. N. lat. 46° 45′. W. long. 63° 53′.
CASE, sometimes denotes a vessel or receptacle in form of a tomb, commonly decorated with gold and silver, wherein the body of a saint, or some relics of it, are preserved.

In which sense, the word is formed from the French chasse. Originally these cafes were made in the figure of little Gothic churches, purportant to that ancient Christian maxim, that the saints, having been the living temple of the Holy Ghost, are entitled, after their death, to have their bones enclosed in the figure of the visible house of God.

The case of St. Genevieve is never brought down without great ceremony, nor except in time of extreme public dangers or calamities.

CASE, John, M. D., in Biography, was born at Woodflock, where he received the rudiments of his education. In 1561, he was elected scholar, and in consequence, master of arts, and one of the fellows of St. John's college, Oxford. Wood celebrates him for his skill in disputations, in which he is said to have excelled all his contemporaries. Marrying some time after, he was permitted by the chancellor to read lectures to the students, in logic and philosophy. He also wrote, for the use of his pupils, short treatises on Aristotle's organon, ethics, politics, economics, and physics. One of them, "Sphera Civitatis fve de Politia," printed in 1580, was pirated on the continent, and copies coming over, Barnes obtained an order, obliging every fellow in the university to take one of his books. In 1580, he was made doctor in medicine, and the same year, prebendary of North Anston, in the church of Surm. He was much respected, both as a physician, and teacher, and acquired, Wood says, a handsome fortune, the greater part of which he left at his death, (which happened on the 23d of January 1590,) to charitable uses. He was buried in the chapel of St. John's college, where a handsome monument was erected to his memory. Wood gives a catalogue of his productions, which are now little noticed. Athene Oxon.

CASE, John, M. D., Granger gives an account of this man. He was a noted astrologer in the time of queen Anne, and succeeded Lilly, who left him possession of his apparatus, particularly his darkened chamber, and pictures, with which he pretended to show his customers their absent friends. Case used to exhibit these to his intimates, in the hours of conviviality, laughing at the folly, and credulity of the people. Over his door was written:

Within this place
Lives Dr. Cafe;

by which delitich he probably got more than Dryden did by all his works. Haller also mentions a doctor John Cafe who published in 1694, "Compendium Anatomicum, nova methodo instructum," 12mo, in which the writer fluently defends the opinion of De Graaf, that quadrupeds, and all other animals, as well as birds, proceed ab ovo.

CASE, or Caso, in Ancient Geography, a small island situated S. W. of Carpathos, and N. E. of the isle of Crete.

CASE, in Grammar, is understood as all the different inflexions or terminations of nouns; serving to express the different states or relations they bear to each other, and to the things they represent. For the reason of the name, see Declension.

There is a great diversity among grammarians, with regard to the nature and number of cases; they generally find six cases even in most of the modern languages, which they call the Nominative, Genitive, Dative, Accusative, Vocative, and Ablativus; but this seems only in compliance with their own ideas, which are formed on the Greek or Latin, and which they transfer to other languages.

The truth is, if by case be only meant an occasional change in the termination of the noun, or name, which seems to be the just idea of case; there will, in this sense, be just as many cases as there are different terminations of nouns in the same number, i.e. in some languages more, in others less, and in others none at all.

Indeed, the generality of authors either have not any precise notion of cases at all, or they wander strangely from that notion: for they always reckon five cases of nouns in the Greek, and fix in the Latin: though several of these cases he frequently alike, as the genitive and dative singular of the first declension of the Latin; the dative and ablative plural of the second, &c. the genitive and dative dual of the Greek, &c. So that with these authors the termination is not the sole criterion of the case.

It seems, however, much more agreeable to the principles of grammar, which only confers words materially, to make as many different cases, as there are changes in the terminations of a name; which would free the English, and other modern tongues, from the embarrassments of cases; and of them expressing the various relations, not by changes in termination, as the ancients; but by the situation of the substantive, as in the nominative and accusative cases, or by the apposition of articles and prepositions. On this footing it is certainly wrong to say, v. g. that of a father, is the genitive case of father; and to a father, the dative; for in to are not part of the noun father; they are no places or terminations, but articles or modifiatives, which shew the different relation of the word father. And the same may be said of the cases of nouns, in the French, Italian, Spanish, Portuguese tongues, &c. Nevertheless, the relation of possession, which answers to the genitive case, is often expressed by a different termination of the substantive: "as God's grace," or, as it was formerly written, "Gods grace," the grace of God. So that the English substantives may be considered as having two terminations for cases; that of the nominative, and that of the genitive or possessive case. In this respect it bears some resemblance to the German, which is probably derived from the same Teutonic original. In the Greek and Latin languages, the words Gen and Patris are real cases of the words Genus, and Patruer, and different from those words; and somewhat like this may be said of the Hebrew, Arabic, Armenian, Polich, and German languages; which in the same number admit of changes in the terminations of words: and yet in these languages, cases are different from what they are in the Greek and Latin. The Hebrew names, for instance, are not properly declined by cases, and to be distinguished by any peculiar terminations; but they are determined principally by the construction and meaning of the sentence or discourse in which they occur, or by certain prepositions, or letters serving the purpose of prepositions, prefixed to the respective words, as in the following example:

| Nom. | Rex. |
| Gen. | Regs. |
| Dat. | Reg. |
| Accus. | Regem. |
| Vocat. | ò Rex. |
| Ablat. | à Reg. |

Hebrew nouns very frequently occur in the oblique cases, although they have no letter or particle denoting these cases; and the letters or particles which make particular cases are frequently connected with other cases. The article 'a which grammarians commonly specify as the mark of the genitive, is applied to all the other cases, and chiefly to the vocative. The relation expressed by the genitive case of nouns sometimes occasions an alteration in them; but this alteration, instead of being in the noun governed, as in other languages, occurs in the Hebrew in that which go

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vortis,
The letter $ ב$, which is an abridgment of the prepositions $מ$, $ל$, or $ל$, generally denotes the dative, and not rarely the genitive, and it is also joined to the accusative, ablative, and even the nominative. The particle or preposition $ו$ or $ו$ is connected, not only with the accusative, but with the dative, ablative, and nominative; and the letter $ כ$, which is the preposition $כ$ abridged, is almost always joined to the ablative, and very rarely to other cases. For the changes that express Hebrew pronouns, see Pronouns.

The cases in the Chaldee language are determined in the same manner with those of the Hebrew; either by the sense of the passage in which words occur, or by prefixing the particles $ י$ or $ י$ to the genitive, $ ב$ to the dative, $ י$ or $ י$ to the accusative, and $ כ$ or $ כ$ to the ablative. The Syriac differs from the Chaldee only in two points, viz. that the mark of the accusative is $ ב$, and not $ י$, and that the note of the ablative is $ כ$, and not the abbreviation $ כ$. The cases in the Samaritan language are formed like those of the Chaldee, by prefixing $ ה$ to the genitive, $ ב$ to the dative, $ כ$ or $ כ$ to the accusative, and $ מ$ or $ מ$ to the ablative. See Macrill's Grammat. Heb.

An ingenious writer suggests that the Greek cafes are formed by certain syllables, which constitute no part of the primitive names of things, but were originally short words, having an independent meaning of their own, and retaining that meaning when joined to these names: thus $συαρα$, $ςαρα$, were originally $συαρα$, $ςαρα$, $ς$, and $ς$, being annexed to mark them as subjects or agents. In ascertaining the precise meaning of the prepositions $ἐν$, $ο$, which are the cognates of the Greek cafes, he intimates, that though the termination called the genitive cafe be rendered by $ ὦ$, it means invariably $ἐν$, $ο$, $ο$, and this appears to be the true signification of the term $ ὦ$, if we regard its etymology, which this author derives from $συα$, $ςαρα$, $ς$, $συαρα$, $ςαρα$, although custom seems to have assigned it a different undeniable meaning, it is in all cafes resolvable into the sense of $ ὦ$. Thus, $συαρα$ or $ςαρα$, being annexed to mark them as subjects or agents. In questioning the precise meaning of the prepositions $ἐν$, $ο$, it is clear, that the termination called the genitive cafe be rendered by $ ὥ$, for it is taken, as he supposes, from an oriental verb signifying to aim, pursue, or stretch after a thing, and hence denotes the thing or object aimed at. Into Greek the original verb has passed in the form of $ἐν$, $ο$; but in Persian, Latin, German, and Welsh, as in English, it has with little variation in found, and none in sense, migrated into a preposition. But $ἐν$ and $ο$, or if the terms are applied to moral actions, $μετα$ and $δειβο$, are often the same. Hence it is that the force of these two prepositions is expressed in Latin by the same termination, the dative or ablative cafe. Hence also, in all languages which admit of cafes, the dative, ablative, and genitive, have a near affinity to each other; and in Greek, the first language, as this writer imagines, in which the use of cafes was introduced, they were all three at first represented by one termination. Jones's Grammar of the Greek tongue p. 194.

Some writers, therefore, granted only the dative, ablative, and genitive, have a near affinity to each other; and in Greek, the first language, as this writer imagines, in which the use of cafes was introduced, they were all three at first represented by one termination. Jones's Grammar of the Greek tongue p. 194.

Some writers think, that the relations signified by the addition of articles and prepositions to the noun may properly be denominated cafes, in English; and that, admitting this principle, there are, in our language, as many cafes as in the Latin tongue. But Mr. Lindley Murray, in his "English Grammar," (p. 54. cd. 1.) observes, that to this mode of forming cafes for our substantives there are strong objections. If an arrangement of this nature were to be considered as constituting cafes, the English language would have a much greater number of cafes than the Greek and Latin tongues: for, as every preposition had its distinct meaning and effect, every combination of a preposition and article with the noun would form a different relation, and would constitute a distinct cafe. Thus our language would be incumbered with many new terms, and a heavy, as well as useless, load of distinctions. Mr. Murray is of opinion, that although this variety of cafes does not at all correspond with the idiom of our language, we may with great propriety admit a cafe in English substantives, which shall serve to denote the objects of active verbs or of prepositions; and which is, therefore, properly termed the objective cafe. He allows however, that the general idea of cafe has undoubtedly a reference to the termination of the noun; and yet there are many instances, both in Greek and Latin, in which the nominative and accusative cafes have precisely the same form, and are distinguished only by the relation they bear to other words in the sentence. Analogy, therefore, warrants our applying this principle to our own language, as far as utility, and the idiom of it, will admit. It is obvious, that in English, a noun governed by an active cafe, or a preposition, is very differently circumstanced, from a noun in the nominative, or in the possessive cafe; and that a comprehensive cafe, corresponding to that difference, must be useful and proper. The infinitives of part- phere, says this ingenious grammarian, and of showing the connection and dependence of words, will be most conveniently accomplished by the adoption of such cafes; and the irregularity of having our nouns sometimes placed in a ca-

Although it should be maintained, that many of the modern languages have not, strictly speaking, any cafes of nouns; yet most, if not all of them, have a kind of cafe in their pronouns, without which it would be hard to conceive the connection, or syntax of a discourse; and which, therefore, make a necessary part of grammar; e.g. in English I and me; and in French, je and me. See Pronouns. For the relation expressed by each cafe, and the mode of denoting them, see Nominative, Genitive, Dative, &c. &c.

Case, in Printing, a large flat, oblong frame, placed above, divided into several compartments, or little square cells; in each of which are lodged a number of types, or letters of the same kind; whence the compositor takes them out, each as he needs it, to compose, and make a page, or form. A frame of cafes, in printing, usually consists of two pairs, viz. an upper and lower, Roman and Italic. A shallow cafe shows the letter best, as being least shadowed by the sides of the boxes. A deep cafe has the advantage of holding a great number of letters, so that the compositor need not distribute so often.

They say, a cafe, or rather pair of cafes, of Greek, of Hebrew, of Pinx, &c.

Case of a filik worm, is a lodge framed within its web, wherein to deposit its cafe. Case is also used for a certain numerous quantity of divers things: a cafe of pilules implies a brace; a cafe of glafs, &c. see Glass.
CASE

Case is also used for a frame surrounding a door, window, or the like. In which case we lay a down or window-curtain, &c.

CASE, when open this, in Law. See ACTIONS.

CASE, spiculated, relates to a kind of special verdict, in which the jury find a verdict generally for the plaintiff, but facilitate exceptions to the opinion of the judge or the court above, on a special case, litigated by the counsel on both sides with regard to a matter of law. This has the advantage over a special verdict, of being attended with much less expense, and of obtaining a much more speedy decision; the point (which fee) being litigated in the hands of the officer of nisi prius, till the question is determined, and the verdict is then entered for the plaintiff, or defendant, as the case may happen.

CASE flotted out of Chancery, refers a question of law in the process of any cause referred by this court to the opinion of the judges of the court of King's Bench or Common Pleas; before whom it is heard, and who certify their opinion to the chancellor in order to a decree.

CASE-hardening, a method of preparing iron, so as to render its outer surface hard, and capable of retaining the file, or any edged tool. It is used by file-cutters for coarse files; by gunsmiths to harden the barrels of guns; and by others, on other occasions.

The process of case-hardening, which is no other than a superficial conversion of iron into steel, depends on the cementation of it with vegetable or animal coal. This treatment converts the external part into a coating of steel, which is usually very thin, because the time allowed for the cementation is much shorter than when the whole is intended to be made into steel. Immersion of the heated pieces into water hardens the surface, which is afterwards polished by the usual methods. Among the receipts given for this purpose are the following: cow's horn or hoof is to be baked, or thoroughly dried and pulverized, to this add an equal quantity of bay-felt; mix them with fine chamber leys, or white wine vinegar. Cover the iron with this mixture, and bed it in the same in loam, or inclose it in an iron box: lay it then on the heath of the forge to dry and harden: then put it in the fire, and blow till the lump have a red heat, and no higher, the mixture he burned much too. Take the iron out, and immerse it in water, to harden. See IRON and STEEL.

CASE-shot, are musquet-balls, flones, old pieces of iron, or the like, put up into cages, and so shot out of great guns.

Case-shot is chiefly used at sea, to clear the enemies' decks when they are full of men.


Gen. Ch. Cul. Perianth four or five-leafed, or four or five-cleft; leaves oblong, flat, coloured; widely spreading. Cor. none. Ned. four or five-leafed; leaflets oblong, obtuse, hirsute, rather erect, half the length of the flaments, and alternating with them. Stam. Filaments eight or ten, awl-shaped, rather erect; anthers oblong, incumbent. Pill. Germ roundish; style filiform, erect, the length of the flaments; stigma capitata, obtuse. Pet. Capule roundish, obtuse, crowned with the permanent base of the style, one-celled, conicoll, thick, trivalved. Seeds generally more than one, compressed, angular, fixed to the valves, immersed in a soft pulp.

Eff. Ch. Cul. four-cleft. Cor. none. Ned. four or five-leafed. Stamen alternate, with the leaflets of the corolla. Calyx barrel, trivalved, one-celled; seeds in a soft pulp.

Sp. 1. C. spinotha, Willd. 1. (C. aculeata; Jacq. Amer. 77. Samyda spinotha; Linn. Sp. Pl. 2. Swartz. Obs. p. 9. Proset Bede. 11.) Flowers obovatus; leaves egg-shaped, serrated, smooth; peduncles axillary, one-flowered; baccifera flowers. A shrub about three feet high. Branches numerous, diffuse, branched when young with a few dilated and broad leaves. Leaves one inch and half long, coriaceous. Flowers white, calyx slightly oblong, obtuse, filaments awl-shaped; anthers oblong. Fruit greenish, purple, mucronate at its summit. A native of St. Domingo. 2. Samyda nitida, Willd. 2. Jacq. Amer. 152. Affl. Herb. 8. p. 52. fig. 1. (Samyda crenata; Poiret Bede. 12.) Flowers obovatus; leaves egg-shaped, serrated, smooth; cymes axillary, peduncled. A shrub about fifteen feet high. Branches numerous, spreading. Leaves from an inch and half to four inches long, alternate, petiolate, very variable in size and form. Flowers small, whitish; leaves of the calyx oblong, Fruit roundish; pulp scarlet or purple. Seeds two, sometimes only one. A native of America in the neighborhood of Carthagena. Perfectly distinct from Samyda nitida. 3. C. bieta, Willd. 4. Swartz. Fl. Ind. Occid. 2. p. 756. (Samyda tomentosa; Swartz. Prod. 68. Poir. 12.) Flowers obovatus; leaves egg-shaped, serrated, rough with hairs underneath. A shrub from seven to eight feet high. Branches alternate, cylindrical, a little angular, pubescent. Leaves alternate, acute at the summit, a little narrowed at the base, nerves and veins, on very short petioles. Flowers axillary and lateral, fascicled, on short peduncles, with membranous scales at their base; calyx four-leaf; segments deeply divided, linear, lanceolate, obtuse, pubescent, whitish, green underneath, permanent, filaments straight, awl-shaped; anthers heart-shaped, erect, yellowish, style trigonous; stigma capitata, a little trifid. Fruit oblong, somewhat acuminate. A native of Jamaica. 4. C. parviflora, Willd. 5. (Samyda parviflora; Linn. Sp. Pl. 1. Poir. 12. 8. folis ovatis cum acuminis; Brown, Jam. 217. Arbor baccifera, &c. Sloane Jam. 157. hist. tab. 214. fig. 2.) "Flowers deciduous; leaves oblong, acuminate, slightly crenate, smooth on both sides, shining; peduncles crowded, axillary, one-flowered." A shrub. Branches diffuse, cylindrical, rather crooked, smooth, blackish brown, sometimes sprinkled with very small oval greyish or yellowish spots. Leaves about three inches long, an inch and half broad, alternate, thin, almost membranous, rather pale underneath; with a few lateral, simple, alternate nerves, and reticulated veins; on short petioles. Flowers whitish, axillary, solitary, or in small tufts; peduncles not less than half an inch long, simple, cylindrical, upright; calyx deeply five-cleft, smooth, ciliaceous. Fruit small, globular; pulp yellowish. A native of Cayenne. 5. C. parviflora, Willd. 6. Jacq. Amer. tab. 85. (Anavanga; Linn. Hist. Pl. 37. fig. 2. Samyda parviflora; Poir. 14.) "Flowers deciduous; leaves egg-shaped, acuminate, serrated, smooth; peduncles one-flowered; aggregate, lateral." A shrub about fifteen feet high. Stems erect. Branches diffuse, slender, long. Leaves alternate, about an inch long. Flowers not axillary; peduncles small; leaves of the calyx whitish, reflexed, egg-shaped, obtuse; filaments unequal, nearly as long as the calyx. A native of Martinique. 6. C. fylleiflora, Willd. 7. Swartz. Flor. Ind. Occid. 2. p. 752. (Samyda fylleiflora, Poir. 15.) "Flowers deciduous; leaves egg-shaped, acuminate, quite entire; branches rodd-like; peduncles axillary, crowded." A shrub. Stems smooth. Branches long, slender, loose, cylindrical. Leaves alternate, acuminate to a great length, thin, smooth on both sides, shining, veined, porous when held against the light, on short smooth petioles. Flowers twenty or thirty together; peduncles about three.
lines long; simple; furnished at their base with small, dry, imbricated scales; calyx very small, whitish; leaves oval, often pubescent; filaments the length of the calyx; anthers whitish, heart-shaped; gero ovate; style trigorne. Fruit about the size of a pepper-corn, redish. A native of Jamaica. 7. C. macrophylla, Willd. 8. Vahl. 9. vol. 2. p. 122. (Pitunja guianense; Blush. vol. 2. tab. 985. Samyda pittum; Poir. 16.) "Flowers decussate, somewhat tomentous; leaves elliptical, acuminate, slightly crenate. A shrub. Branches cylindrical, smooth, spotted. Leaves from six to eight inches long, more than three broad, petioled, alternate, firm, thick, coriaceous, sprinkled with pellucid dots, smooth on both sides, deep green above, paler and somewhat rufous beneath; marked with lateral, curved, deep brown nerves; and with transverse, fearlessly reticulated veins. Flowers in small axillary branches; peduncles short, simple; calyx small. Fruit about the size of a walnut. A native of Cayenne and many other parts of South America. 8. C. formulata, Willd. 9. Swartz. Flor. Ind. Occid. ii. p. 213. (Samyda ni-viana; Poir. 17.) "Flowers deciduous; leaves ovate-lanceolate, fliglty ferrat; little branches zig-zag; peduncules axillary, crowded. A shrub. Branches smooth, cylindrical, long, covered with a cinereous bark; ramifications scattered, almost filiform, fritated. Leaves an inch and half long, alternate, a little acuminate, smooth on both sides, bright green above, revved and veined, on short petioles. Flowers whitish, very small, axillary, ten or twelve in a bunch; peduncles about a line long, furnished at their base with small membranous scales; calyx-leaves oval, concave, ciliate; filaments very short; anthers ovate-heart-shaped; style awl-shaped; stigma obtuse. A native of the island of Nevis. 9. C. hirsuta, Willd. 12. Swartz. Flor. Ind. Occid. ii. p. 215. (Samyda hirsutra; Poir. 18.) "Flowers decussate; leaves egg-shaped, acuminate, tooth-ferrat; hairy, villous underneath; peduncles lateral, crowded." A shrub. Stems woody. Branches cylindrical, flexible, pubescent. Leaves large, alternate, petioled, soft. Flowers in small lateral branches, not axillary; calyx-leaves ovate-lanceolate, whitish, pubescent, a little villose; filaments straight, awl-shaped; anthers oval; style trigone, the length of the filaments. Fruit oval, trigonous. A native of Jamaica and Hispaniola. 10. C. viridiflora. (Samyda viridiflora; Poir. Encycl. 17.) "Leaves ovate-elliptical, smooth, somewhat coriaceous; flowers nearly fife, axillary, falciculated." A shrub. Branches smooth, cylindrical, long. Leaves from four to five inches long, two and a half broad, alternate, membranous, glaucescent green, inclining to yellowish, nearly entire, with lateral nerves and reticulated veins, on short petioles. Flowers pubescent, greenish, short, with five ovate, rather obtuse segments. A native of the East Indies, described from a dried specimen in the herbarium of La Marck.

CASEARIA versicolor, Willd. 3. See Atheros gua-nenfis. Willdenow is right in his arrangement. This plant is properly a caferia; and the genus athenum of Schereber, (Truncana of Aubelet,) ought to be abolished. The number of flaments, it is now allowed, cannot determine a generic character. C. elliptica and ovata, Willd. 9. 10. See Ana-vina lanceolata and ovata.

Profess Martyn has omitted all our species, having inadvertently referred from caferia to samyda, and from samyda back again to caferia.

Poiret has united caferia to samyda, and observes, that these two, anavinga and aquaria, are all nearly allied, agreeing with each other in the infection of the flaments into a particular body, attached to the inner part of the calyx near its base; and differing only in the manner of their infection, and in the number of the valves and cells of the capsule. The rim into which the flaments are inserted, and which has been usually called a nectary, he thinks is properly a monopetalous corolla, adnate with the calyx, and toothed or divided almost to its base. Into this corolla the flaments are inserted, either alone, or in anavining, aquarian, and the original caferia, or adnating, through their whole length, to its teeth, as in the original samyda, and then giving the answers the appearance of being felix. Considered in this point of view, they would form one well-marked genus, having for its essential character "a very short, monopetalous corolla, with the flaments inserted into its tube." It is sufficiently evident from the description of the species of caferia given above, that a monopetalous or polyphalian calyx can by no means be admitted as generic distinctions. Such an union would, in our judgment, be a real improvement to science, as it would render our ideas of the subject more compact and not less distinct. Though the species at present known are not very numerous, they might be conveniently thrown into separate families, nearly corresponding with the present genera. There is not one species now constituting the whole of the genus aquarian, that would differ from its congeners on account of its two-celled, two-valved capsule. See Poirert in Ency. Method. vol. vi. p. 82.

CASEI DI CAVALLI, the name of a peculiar cheese, famous in Italy, and many other places, and made of the milk of the female buffalo, that species being as commonly tamed and kept there as the ox and heifer with us.

CASEL, John, in Biography, a learned German, was born at Gottingen in 1533; and having studied in several universities, travelled to Italy, and was made doctor of laws at Pisa. In 1553 he became professor of philosophy and eloquence at Rollock, and afterwards at Helmstadt, where he died in 1613. He excelled in his knowledge of the Greek fathers; and he warmly opposed Daniel Hoffman and others, who maintained that philosophy is adverse to theology, and that many things are true in the latter which are false in the former. He carried on a correspondence with some of the most eminent scholars of his age; and left many works, both Greek and Latin, in verse and prose. A collection of his letters was printed at Frankfurt in 1687, 8vo. Moreto.

CASELLA. We used to imagine that this was only a poetical character in the Purgatorio of Dante; but as his commentators call him an ancient Italian musician and composer, he must not be passed without a salutation; particularly as his existence has been acknowledged by Lucio da Figoli, who flourished in 1360, and in a note to one of his madrigals, prefixed in the Vatican library, which says, Caila dize il fiore, "this madrigal was set to music by Casella." There is something in the description of this imaginary correspondent which flatters and affections, that I cannot help wishing to convey an idea of it to my English reader. Dante, after visiting the infernal regions with Virgil, is conducted by the same poet into purgatory; where, soon after his arrival, he saw a veil spread over the shore laden with departed souls, under the conduct of an angel, who brought them thither to be cleansed from their sins, and rendered fit for Paradise: as soon as they were disembarked, says the poet, "they began like beings landed on a foreign shore, to look around them:"

"On me when first these spirits fix their eyes,
They all regard me with a wild sur prise,
Almof forgetting that their firm require
The purging remedy of penal fire:"

When
When one of these advance'd with eager pace, 
And open arm, as me he would embrace; 
At sight of which I found myself impell'd 
To imitate each gesture he beheld. 
But vain, alas! was every effort made, 
My disappointed arms embrace a shade: 
Three did vanity my graceclude, 
Yet fill the friendly phantom I pursued. 
My wild astonishment with smiling grace 
The spectre saw, and chide my fruit's chance. 
The voice and form now known, my fear subsided, 
O flay, cried I, one moment with thy friend! 
No suit of mine is vain, the vision found, 
I love thee living, and I love thee dead. 
But whence this halfe—not long allow'd to flay, 
Back to the world thy Dante takes his way— 
Yet let this fleeting hour one boon obtain, 
If no new laws thy tuneful pow'r's restrain, 
Some long predominant o'er grief and woe, 
As once thou forg'd above, now flog below; 
So shall my foul, releas'd from dire difmay, 
O'ertake the horrors of this dreadful way. 
Caffella kindly degird his voice to raife, 
And fang how Love the human bofom awakes, 
In brains to exquisitely fweet and clear, 
The found fill vibrate on my ravip'd ear; 
The shadowy troops, extatic, lifting round, 
Forgot the past and future in the found."

Cafella, Itali. a small house, but in Myfie it implies a 
lar, a compartment, containing fuch a portion of notes as 
the character or characters for time direct at the begining of a movement. See Time, Bar, Measure. 

CASELLE, in Geography, a town of Italy, in the 
principalty of Piedmont, on a small river which runs into the 
Stura; 6 miles N. of Turin. 

CASEMATE, or CAFEIMENT, in Architecture, the 
name with casement, denotes a hollow moulding, which 
some architects make one-fifth of a circle, and others one-
fourth. 

CASEMATE, from the Spanifh word cofaminata, or from the 
Italian word cofaminata, in Military Language, a low, 
covered, or concealed house. A cafeinate may in general be 
defined to be a subterraneous or covered arched work. Cafe-
mates are made in garrison'd places, in order to place the 
troops of the garrifions, when off duty from, under, from 
shells, &c. They are alfo made sometimes under different 
parts of the rampart of a place with embrafures, for cannons, 
or loop holes for musquetry. 

This name is alfo given to subterraneous or covered arched 
works, on that part of either flank of a baftion, which is 
next to the adjoining cafeine made there for placing some 
guns in, to defend the paffage of the moat or ditch, the face 
of the oppofite baftion, and the approaches to any breach 
that may be made in it. That part of the flank is taken 
inwards towards the capital of the baftion, that it may be 
covered from the enemy's or foe's fire, by the remaining 
part of it, which, when rounded, is called a round orifil, 
but when let without being rounded, is called a square 
orifion. The part of the flank thus taken inwards is there-
fore called the retired or covered flank, as alfo cafeimate and 
place baflhe; and the side of it next to the curtain is generally 
in the continuation of the line of defence, which part of the 
said line is called the retirade, or retracment of the flank, or 
the continuation of the cafeinate. The vauts or cafeimates in 
this retired flank have commonly the foles or bottoms of their 
embrafures a little above the terre plain or level of the 
place or country, in order that the guns in them may fire 
over the parapet of the faflie brawe, in the ditch before it, if 
there be any. 

Cafeinated flanks are rarely made ufe of at prefent, 
because the enemy's batteries can generally bury the ca-
non contained in them under the rubbifh and ruins of their 
vaults, and because the baffle, with which they are always in 
a short time filled, renders them imprefant to thofe who 
fire the guns, notwithstanding all the flues, vents, or air-
holes that can be made in them. Besides these inconve-
niences, muflinery, if they be exposed to its fire, will, within 
a certain diftance, when properly made ufe of, always 
flame cannon, whether they be in cafeimates or not. 
Engineers, therefore, at prefent commonly make their re-
tired flanks open at top, and call them low flanks, or plaque 
bar. 

A low flank ought to have a horizontal depth or thicknefs 
of at lead 16 yards; to wit, 3 for its parapet, and 5 for its 
terre-plains, or rampart behind the parapet, and if there be 
two of them, they ought together to have a breadth or 
thicknefs of at lead 32 yards. 

Low flanks have feveral disadvantages. If there be more 
than one of them in the fame flank, they cannot well be 
made ufe of at once on account of the flame and flashing 
of the powder and the rubbifh that is constantly tumbling down 
from one of them into another. They become almoft ule-
less when the ravine is once taken, by reafon of the com-
mand it has over them, unless they be remarkably well 
covered by the orifions. And the rubbifh which falls down 
from the higher flanks upon the lower, forms a gentle flope 
for the enemy to mount on to the affault. The left low 
flanks, perhaps, are the tenailles, or thofe parts of the 
small brawe of the ditch, that are in front of or oppofite to 
the flanks, and diftant from them reffpectively from 20 to 24 
yards. 

The chevalier Antoine de Veille, in speaking of the inconve-
niences and uiltility of cafeinated low flanks, exprefsed 
his sentiments thereon in the following words: "Autrefois 
on faifoit aux flanes des voutes ou on mettoit le canon tout 
couvert, et par deffus ils en faiifoient d'autres pour mettre 
d'autres canons; mais cela n'est plus en ufage, à cause des grandes incommodez, qu'ont à veu arriver en ces places. 
Car aprés qu'on avoit tiré, la fumée remplifoit de telle façon 
ces voutes, qu'il estoit impoffible d'y demener dedans, ni rien 
voir pour recharger, quelques foupiraux qu'on y peut faire, 
oultre que l'etonnement du canon'ébranloit tout; et l'ennemy 
tirant dans ces voutes bafles, les eclats et debris bleftoient et 
touchoient ceux, qui eloient dedans, et en peu de coups les 
eloient en ruine. C'est pourquoi on a laiffé ces voutes et on 
fait les places bafles découvertes. Et pour avoir deux places 
on fait le premier plus baffe un peu par deffus les parapets 
de faflie-barmes, s'il y en a. Les merlons quand a leur face 
sont du tiers du flanc, ou de la morte, comme nous vous dirons. 
Lieu profond en dedans et de quatrejeps, qui font pour les 
merlons, fix pas pour le dedans a mettre les canons, et trois 
pour les voutes lorsqu'on les met en ce lieu. La place baffe 
doit aller en clargifant du cote de la courtine afin que le 
canon, qui eft là, puisse etre pointe vers la contre-
ecarpe. 

Du cote de la courtine doit être l'entree ou voute, qui doit 
commencer au dedans de la ville, passant par defous le ramp 
part de largneur et hauteur suffisante pour pouvoir mener par 
la le canon et munitions." 

CASEMENT, is used in building for a little moveable 
window, usually within a larger, being made to open or turn 
on hinges. We say, a single cafeament, a folding cafeament, a 
cafeament.
CASFONMENT with a lock, with a turn-about, or turn-buckle, a
cafemint with a cock-pour or pull-back at the hind-side,
wherewith to draw it to.

CASENA, or CASSena, in Geography. See Kasa-

CASENDORF, a town of Germany, in the circle of Franconia, and principality of Cuimbach; 7 miles S.W. of
Cuimbach.

CASEM, a tow of Perfa, in the province of Iraq; 160
miles E. of Hufan.

CASEOUS, something that partakes of the nature or
qualities of cheese, which see.

CASERNS, in French caserne, in Military Language,
are, briefly speaking, small houses built along by the ramp-
part of a fortified place, for lodging the folders of the gar-
ron, in order to render them as little troublesome as possible
to the inhabitants. Each casern or barracks for the infantry has gen-

eral, in Germany, four beds for six soldiers, three and three. One-half of
these mounts guard whilst the others remain there to secure
that quarter. And each casern for the cavalry commonly
holds four horsemen. But neither these nor any other ca-
ferns that are erected, either adjoining the rampart or
partly connectd therewith, are carried along any other
parts of it then those that are behind the curtains, or lie be-
tween the batallions, across the gorges of which they seldom
or ever extend.

Cafemint signifies not only such small houses as we have just
been speaking of, but also any buildings or edifices, however
large or extensive, erected, and designed for the reception and
accommodation of troops. In a city of war, or fortified
place, they are commonly constructed between the rampart and the houses of the town or city, as being there most
convenient for guarding against and preventing surprisals. The
caserns or barracks for the infantry should be kept separate
from those of the cavalry and dragoons, as they are at Nimes
and several other places in France; and the list of these
ought to be placed as near as possible to convenient or com-
modious watering-places for horses. In France, and some
other countries on the continent of Europe, these buildings
have generally been erected in large towns and cities at the
expense of the inhabitants, and in small ones at that of the
state. But in this country the expenditure on all such erec-
tions is defrayed by the public. They should as much as
is possible, when it can conveniently be done, be placed to-
wards the east, on account of the air. When there is ground
enough for the purpose, it is of advantage to include with
them a square or rectangular space, sufficiently large, not
only for parading, but also for exercising the troops. The
folders are then easily confined to their quarters, and

kept out of the way of quarrels, riots, and mischief. They
are more obiservant of order and regularity, being imme-
diately under the eyes of their officers, than they are when
distributed among the houses of the inhabitants. And as
they then are, as it were, in one body, and the rooms they
are lodged in are contiguous to one another, and not far
from the apartments of their officers, orders can be executed with
more dispatch and privacy than when they are either
dowered in separate or detached places, or are billeted and
disperses among the citizens. In time of war, or
during a siege, many inconveniences may arise from having
the folders scattered about in the houses of the inhabitants of
a fortified town or city, instead of having them collected
together in the body or in a few separate and distinct bodies,
under the inspection at all times of their officers. In case of
any alarms happening, the governor or commandant of the
place cannot afford the garrison without a good deal of
trouble and a considerable loss of time. Should he wish to
send a party or corps out of it either in fortes or other duty,
he cannot do it without the knowledge of the whole town
or city. Such a dispersion of troops tends to render them
disorder, diffluent, and negligent of discipline; whereas
the keeping of them together in barracks or cafemint, contributes
much towards the observance and maintenance of it.

Cafemint or barracks are built and constructed differently,
according to the situations on which they are placed. When
the ground will admit of it, as we have already observed, it
is advantageous to enclose with the buildings a square or
rectangular space, yard, court, or area sufficiently large for
not only parading the troops, but also for all the exercises
of detail, and that too for either infantry or cavalry, who ought to
be kept separate. For a large court or area is necessary
for the one as well as for the other. In such buildings gal-

deries should be carried along their whole extent, to furnish
an easy communication between the different rooms or cham-
bers. When they are erected for cavalry, the men ought to
be lodged immediately over the stables for their horses.

When barracks are built along by the rampart opposite to
the curtains, as Marshal Vauban has practiced in a good many
places, they are generally composed of large bodies of
buildings for the troops to lodge in, and at the end or ex-

tremities of them are barracks or pavilions erected for the
officers. These barracks or cafemints are commonly two
stories high, independent of the ground floor or stock; and
sometimes three.

In every body of double barracks, there are, for the most
part, on each story four rooms, each two of which answer to
the fair-cafe next to it. Every room ought to be at least
22 feet long and 18 feet wide, which is a size sufficient for
four beds. Those on the ground floor should be not less
than 12 feet high, those in the next story 12, and those
in the upper story should be at least 8 feet high. The
doors ought to be 6 feet 4 inches high, and 3 feet at the
bald.

And whether they be built with bricks or stones, the walls ought to be two feet thick or upwards. A fort of
casern is sometimes made in the walls, at the upper part of
each story, which is useful in helping to preserve the faces
and outsides of them, by preventing water or moisture from
running or trickling down them. In the barracks at
Woolwich the rooms are too small, being each of them
only 16 feet square. There has been no general rule, in-
deed, either established or observed in this country for such
buildings, and the sizes of the rooms or apartments in
them.

Though barracks or casemint of any form or description
are seldom or ever erected along by those parts of the ramp-
part, where the flanks and faces of the batals are, as
they are along by those that lie between the batals, yet
when these works are empty, instead of being as they gen-

erally are, especially of those of them as are not likely to form
part of any front, that may be attacked by a besieging en-
emy, it may not only be advisable, but extremely useful,
to erect barracks, or cafemint, opposite to their gorges, and
at some little distance from the same, converting the interior
areas or parts of them into gardens to be cultivated by
the troops inhabiting these buildings. These would furnish
them not only with a considerable proportion of their nour-
ishment, but also with proper and useful exercise, and
agreeable walks, without following worthless strolling in any
way, or manner whatsoever. The strength or defence of the
place. In fortified towns or cities, however, with enclo-
sures of considerable extent, and large garrisons, the bar-

acks,
racks, or cafeneas, are generally erected along by the works in different places separate and distant from one another, but with easy and speedy communications, there being seldom more such buildings in one of those places than what are sufficient for lodging two battalions. In consequnce of this precaution, arrangement, and distribution of their garrisons, those entrusted with their defence are less apprehensive of being surprised than they otherwise would be, as the different parts of the works are thereby equally guarded and defended. Such an arrangement, however, is not always made or observed in fortified places. For barracks, that have been formerly erected without any regard to such a distribution, are commonly repaired as long as they are capable of receiving repairs, or being rendered useful. And in Roman Catholic countries old religious edifices and buildings originally erected for pious purposes, which for the most part are agreeably and elegantly fitted, are frequently converted into barracks if they happen to be near the gates or principal works.

While the feudal system existed, and chivalry was in repute, the militia, which was supplied in every state or country where it prevailed, formed all the troops that either the barons made use of in their feuds and contentions, or sovereigns employed in the forcible assertion of their claims and pretensions. During the prevalence of that system there was no standing army or regular military establishment either in this country or on the continent of Europe. And as such forces were seldom assembled or brought together but on the spur of the occasion, or at the moment, when they were going to attack, repulse, or engage their enemies; as they very rarely took the field but in mild and favourable weather and were generally dismissed, before the setting in of winter or the rainy season to return to their respective homes and places of ordnary abode, it was not necessary to erect barracks for them to lodge in. As the strength of that system became somewhat broken, and the rigour of it began to decline in the time of Charles VII. of France and his contemporaries, he and some others of them, instructed by experience and influenced by mutual example, began the practice of keeping bodies of troops constantly on foot and in pay. From this originated the necessity of considering the belt and most advantageous manner of providing habitations or lodgings for them. But as the military establishments under these princes and their successors were but small, even in time of war, and very trifling during peace, the difficulty of procuring lodgings for them was not great. At present, however, when such establishments are much increased and augmented, the belt manner of lodging them, either in garrisons and along the frontiers, or in the interior parts of a country, becomes a matter of serious concern to the prince or state.

When troops are to remain for a considerable time in one place there are four different ways, in which they may be lodged or disposed of, namely, in tents, in huts, in barracks, or in the houses of the inhabitants. To make soldiers live constantly either in tents or huts would be precariously and absurd, as it would operate injuriously to their health and fitness for service when necessary, subjects them to unnecessary hardships and inconveniences, without any favoring or diminution of expense to the nation to which they belong. No question then on this subject remains but between the propriety of keeping them in barracks or the distributing of them among the houses of individuals.

As a soldier is a man, and ought to be regarded as a citizen or member of the community in every country, but more especially in a free one like Great Britain; and is moreover entrusted with the defence of our persons and property, some attention should be paid to his comfort and convenience. To preserve, however, public tranquillity during peace, particularly in a nation under an arbitrary or monarchical government, and enforce fidelity to its operations in time of war, soldiers should be subjected to an exact and a rigorous discipline; for the due observance of which they ought to be so disposed of as to be frequently visited and looked at without much trouble or difficulty, to be easily assembled, to have their conduct liable to constant notice and inspection, to have their mode of eating and living daily and properly attended to, and to be able to execute with promptitude and expedition the orders that may be given to them from time to time. But strict attention to these essential circumstances is in a great measure incompatible with their being scattered or dispersed over the whole of a large town or city. For it must certainly be allowed that such a dispersion of them has a great tendency to weaken and destroy discipline, to render them restless and dissolute, and to create in them a dislike of order and subordination, and a strong inclination for indolence, softness, and ease. In despotic countries, or where mercenaries are partly employed, it is not only destructive of discipline, but extremely dangerous. It is, therefore, a natural and invariable maxim of such governments to keep their troops as separate and distinct as possible from the rest of their subjects, to inspire them with views and sentiments repugnant to theirs and incompatible with civil liberty, and to make them believe, that their interests are not only different from, but opposite to those of the people; as their despotic mandates, oppressive impositions, and arbitrary regulations must be enforced when necessary by the soldiers, and the people must be rendered sullen and obedient to them by the terrors of military execution. In this free country, however, things of this kind ought to be guarded against with the utmost caution and circumspection. Special care should be taken to prevent the soldiers from forgetting that they are citizens, or from supposing that their interests are in any way distinct from or inconsistent with those of their fellow subjects. It ought to be inculcated into their minds, that they are serving and are to fight, not only for their king, but also for themselves, and for their country, her constitution, her liberties, and her laws. An intercourse between them and the people, instead of being prevented or disconcerted, should not only be permitted but countenanced. And they ought never to be confined to barracks to the prevention of such an intercourse, but in certain circumstances, and on certain occasions. Our learned commentator on the laws of England, in expressing his sentiments on this subject, makes use of the following words. "Nothing ought to be more guarded against in a free state than making the military power, when such a one is necessary to be kept on foot, a body too distinct from the people. Like ours, therefore, it should wholly be composed of natural subjects; it ought to be enlisted for a short and limited time; the soldiers also should live intermixed with the people; no separate camp, no barracks, no inland fortresses should be allowed. And perhaps it might be still better, if, by diminishing a rated number, and enlisting others at every renewal of their term, a circulation could be kept up between the army and the people, and the citizen and the soldier be more intimately connected together." Blackstone's Commentaries, book i, page 113. See Army.

In attempting any reformation or improvement of our military establishments we ought never to forget, that Great Britain is an island, and rests not principally on her troops for her defence, that we have seldom or ever any necessary occasion for employing them on the continent, and that it is therefore proper to extend and abridge in thinking of affording our military system
in every respect to those of the other nations of Europe, which have no other security, protection, or defence. The maxims, that those employed as the defenders of this island should think of nothing but their misfortunes, that they should be rendered a sort of mere machines at the will of undergoing even a degradation of intellect, and that they will not fight better in defence of it for having flaves in it to lose, are not only ridiculous, but truly abominable. Were not the nobility, the most glorious and most successful struggles in support of freedom and independence, that are recorded in the annals of mankind, made by states who did not even enjoy the immense advantages of our insular situation, who had no separate military establishments, whole troops were their citizens, who after the emergencies that called for their services and exertions were paid, returned to their various occupations in society, and to the peaceful pursuits of life? And were not the troops of that people who conquered the world, composed entirely of citizens, who after performing the services they were employed on, returned to mix with the rest of the community? As to the idea of these united islands having a regular standing military force sufficient for enabling us to restore the continent of Europe to an equilibrium, or to perpetrate to the different powers in it their relative degrees of strength and territory, it is too extravagant to be entertained by any but the most visionary and wildest of men, who, cherishing such chimeras, lose sight, not only of the constitution of this country, but of every principle and consideration that ought to govern their deliberations respecting her welfare, security and defence.

We will not, like the learned judge, go so far as to assert, that no barracks ought to be allowed. For within works and fortified places, such as Portsmouth and Plymouth, if the latter, indeed, deserves the appellation, they may be proper, allowable, and necessary. But out of such places they ought not, on any account or pretext whatsoever, to be tolerated to any great extent.

In this country there never has been any certain or established rule for the building of barracks, and the relative dimensions of their several component parts. But in France, which has always been a kind of arbitrary government, and is at present a peculiar species of military despotism, ordinances for that purpose were made from time to time. Even in that country, however, such regulations have not been at all times rigidly observed or extended to

CASELLA. In Geography, a city of Naples, in the country of Lavora, about 16 miles from the capital, situated at the foot of a lofty ridge of hills and irregularly built. This place is famous for the magnificent palace caused to be erected by Charles III. of Spain, according to the designs of Vanvitelli, and furnishing in size and solidity almost every royal edifice in Europe. The vast dimensions of its apartments, the bold span of their ceilings, the excellence and beauty of the materials employed in building and decorating it, and the strength of the masonry, claim the admiration of all beholders, who must confess it to be a dwelling spacious and grand enough to have lodged the ancient masters of the Roman world. The two principal fronts are 787 feet in length, and contain five stories of 37 windows each. The two other sides are 616 feet long, and consist also of five stories, in each of which are 27 windows. The interior is divided into four courts, and in the centre of the palace is a superb hall-cafe, crowned by a circular hall which affords a communication to every part of the apartments. The richest marbles are displayed with profusion, most of them being dug out of quarries within the realm. The chapel is inlaid with panes of yellow marble. The theatre is a master-piece of art; antique columns of alabaster support the roof and divide the house into 42 boxes richly decorated, and so arranged as to set off both actors and spectators to the best advantage. The gardens are very extensive, but formed with wide sultry alleys and crowded rows of statues. A broad canal intersects the garden and paffes to the hills at the distance of nine miles from the city, where it collects, for the supply of the palace, the freams that in ancient times were conveyed to Capua; and ifhe are conftituted to one regular channel, and conducted by an easy fall along the faufonities of several vallies. The depth of one hollow, and the height of the opposite ridge of hills, made it neceffary to build an aqueduct across for their conveyance. This aqueduct, distant 6 miles from the city, about two miles in length, and proportionately broad, is an edifice of three stories of arcades, of which the upper one is divided into 43 arches, the lower ones, on account of the declivity of the hills and contraction of the valley, consist of fewer. From hence the waters are carried in a channel to the cascade near the royal gardens, and falls under the city. The pavement of this aqueduct is formed of calcareous stone, with which the neighbouring mountains abound; and the remainder of the edifice is constructed with volcanic tufa, in which are intermixed some pieces of enamel. Sir William Hamilton informs us, that in the environs of Capua, below a stratum of vegetable earth four or five feet in thickness, we meet with cinders, pumices, and fragments of lava; and that in digging near the foundation of the aqueduct volcanic earths are discovered. Spallanzani (see his Travels, vol. i.), on examining the adjacent country, found that it was wholly calcareous, not excepting the highest mountains, almost all of which are of the same consistence and colour with the chains of hills between Naples and Loretto. This place was at first a hamlet, built by some families that escaped from the ruins of Capua; and from the weakness of its situation it was called Casaerta, or clumsy house. It now feems, says Swinburn (Travels in the Two Sicilies, vol. iii.), very likely to relapse into its pristine state by the emigration of its inhabitants, drawn into the plain by the conveniences of the new city and the charms of its court. The monarchs of the country have lately expended large sums in embellishing the environs of Caperta, in planting groves, and building places of rendezvous for hunting. Nat. 41° 50'. F. long. 6° 5'.

CASES referred to the Romish Policy, are considerable sums, the abolition of which is referred by the superiors to themselves, or their vicars.

There are some cases referred by the pope, and others by the bishops; in convents some are referred by the chapter, &c. None but these, or their vicars, can absolve in such cases; except at the article of death, when all referred cases are abatable, by the ordinary.

CASH, in Commerce, theflock or ready money, which a merchant, or other person, has in his present disposal, to negotiate; so called from the French term, caif, i.e. chef, or coffier, for the keeping of money. M. Savary tefts, that the management of the cash of a company is the most considerable article; and that whereron its good or ill success chiefly depends.

CASH BOOK. See Book.

CASHAN, in Geography, a populous and wealthy city of Persia, in the province of Irak-agami; situated about 98 miles N. of Ifpanah, in a large plain near a high mountain, which being opposed to the south is so much affected by the reverberation of the sun's rays in summer as to be intolerably hot. The bazaars and baths of this place are elegant structures, and the royal inn founded by Abbas the Great, in the suburbs, is the fairest in all Persia. Adjoining to it stands the royal palace,
CASH, a city and port town of the county of Tipperary, Ireland, situated about three miles east of the river Suir. It was anciently a place of great importance and the residence of the kings of Munster, who are supposed to have had a house of florne on the rock in the 15th century. Cormac Mac Cullinan in particular, who was at the same time prince and bishop of Cashel, resided here at the beginning of the 10th century. In 1172 Henry II. of England visited this town, in which he received the homage of Donald O'Brien, king of Limerick, and held a synod by which the supreme lordship of Ireland was confirmed to him, and some ecclesiastical regulations were adopted.

Cashel was surrounded by a wall which, though now moulderimg, seems, from two gates of tolerable workmanship yet remaining, to have been of better materials than the generality of such enclosures. But its ecclesiastical ruins are those for which Cashel is chiefly distinguished. The chief of these are on the celebrated rock of Cashel, which is seen at a great distance and in many directions, and which of course has a very extensive prospect.

The old cathedral appears to have been a large as well as handsome Gothic structure, the dimension of the nave and choir from east to west being about 200 feet. Some have supposed that it was the first florne building in Ireland, but this appears to be a mere conjecture. Donald, brother of Morrough, king of Munster, about 1080, is generally recorded as the founder of it, and his grant of lands was confirmed by king John, as appears from an old statute. Sir James Ware, however, was of opinion that it was not built till about the time of the arrival of the English under Henry II, perhaps supposing with that prejudice which blinds many writers, that the Irish were incapable of raising such a structure.

Cormac's chapel, the ruins of which join the cathedral, and which is 50 feet by 18, is a very curious structure of a style of architecture totally different from that of the cathedral, and supposed to have been built by Cormac, about 902, which would be near two centuries earlier. There is also on the rock near the east angle of the north aisle, a lofty round tower, which is 54 feet in circumference and is divided into 5 stories with holes for joiils. This tower has a communication with the church by an subterraneous passage, which implies that it was used for some religious purpose. From its having been built of free florne, when the rock and all the other buildings upon it are limestone, Dr. Campbell infers its being of greater antiquity than the rest. The whole rock was enclosed by a wall, within which was the residence of the archbishop; and it is supposed by Mr. Ledwich to have been a Maniera, or habitation of a great number of monks.

The church being long in a ruinous condition was repaired by Richard O'Heden, archbishop, in 1430, and part of it was used as the metropolitan church till 1730, when it was prematurely unroofed by Alexander Price, and thus exposed to the effects of the weather. In the unhappy civil war of 1641, the rock having been taken possession of by lord Tallie, was stormed by the Earl of Inchiquin, and many persons were put to death. Cashel is a tolerably well-built town, containing about 622 houses, but without trade.

There is a handsome market-house, a feilions-house, the county hospital, a chaplery, and a barracks. The church is a new and neat structure, and the archbishop's palace, though plain, is large and commodious. The city is governed by a mayor, recorder, and bailiffs, and it sends a member to the imperial parliament. Distance S. W. from Dublin 77 Irish miles. N. lat. 52° 30' 30", W. long. 5° 54' 59", Dr. Beaumont. Campbel's Philosophical Survey. Collectanea de Rebus Hibern. Ledwich's Antiquities, &c. &c.

CASH, Archibishopric of, in Ireland; chiefly confined to the county of Tipperary. It was founded or restored by Cormac Mac Cullinan at the beginning of the 10th century; was made an archbishopric by cardinal Paparo, the pope's legate in 1152, and was united to Emly in 1568. The united sees are very compact, extending 32 Irish miles in length, and 70 in breadth. There are in the union 15 parishes, which make 47 benefices, and have only 35 churches. The cathedral, which serves also for a parish church, is a large and handsome modern edifice, completed by archbishop Agar, who also established a choir. The archbishop is primate of Munster, and ranks next to the archbishop of Armagh and Dublin; his suffragans are the bishops of Killaloe, Limerick, Cork, Cloncye, and Waterford. Beaumont's Memoir.

CASH, Pfister of, an historical poem, or rather a collection of poems in the Irish language, written by Cormac Mac Cullinan, prince and bishop of Cashel, about 902. This Cormac is mentioned by Caradocus Llanecavenus in his Chronicle of Wales; and was slain in battle in 908 either by the Leinster forces, or by the Danes. He is represented to have been learned and well skilled in the Irish antiquities, and his pfister is highly valued by many as an authentic record. It has not been published, but part of it, at least, is said to be in the Bodleian library, and has been seen by respectable writers. Extracts from it have been published, and it is often referred to for the events of some centuries preceding. Stillingfleet and Pinkerton have, however, perhaps too rashly, affirmed it to be a collection of poetical fiction, compiled in the 13th century, an opinion adopted by Ledwich. Is it not probable that whilst an unreasonahle acct has been laid upon its authority by the advocates of early Irish literature, the others have been influenced by a prejudice against this? Testimony in favour of the authenticity of the work, and there does not seem to be any reason for calling it in question on this occasion, but an unwillingness to admit an Irish work of so early a period. As to the degree of credit such a work is entitled to, admitting its authenticity, it seems to be such as is usually given to poetical records, in which the facts related are generally so mixed with fable, or so exaggerated, that it is very difficult to draw the line of distinction. Ware's and Ledwich's Antiquities of Ireland. Nicholson's Historical Library, &c.

CASHENDAL, Bay, called also the Red bay, and sometimes confounded with Cullhendow bay, which lies a little north of it; an inlet on the north-east coast of Ireland, in the county of Antrim, where a ship may lie in moderate weather, above two cables length from the shore on from three to nine fathoms water. White limestone is found near this part of the coast. N. lat. 53° 4'. W. long. 5° 54', Hamilton's Anton. McKenzie.

CASHFORD, in Botany. See ANACARDIUM.

CASHIGAR, anciently CASIA, in Geography, formerly a remarkable town of Little Bithania, giving name to a considerable kingdom, the limits of which nearly corresponded
with those of Bucharia. This town, though fallen from its ancient splendour, still retains some commerce. See Little Bucharia.

Mr. Rennell has taken great pains to investigate and ascertain the position of Cashgar; and he observes, as the result of his inquiry, that Cashgar, Koter, &c. by their known situation with regard to Samarcand, must bear to the west, rather than to the east, of Cashmere; and also that the ridge of mountains, (the Imaus of the ancient geographers,) on the west of Cashgar, Koter, and Karia, can be no other than that which separates those countries from Little Thibet and Badaikhan, and that joins on the south to Cashmere. By a mean deduced from the tables of Abulfeda, Uling Beig, and Nasreddin, Cashgar is about 7° 39' of longitude east of Samarcand; and of course 2° W. of Cashmere. The parallel of Cashgar, given in the tables, is 44° 5', which would place it nearly N.E. from Samarcand. That it bears considerably to the north of east from Samarcand is strongly implied by the direction of the roads, which lead to it, from Samarcand and Bokhara; that of the former being through Copend and Anakand (or Fergana,) both of which lie to the north-east of Samarcand; the former at seven, and the latter at ten days' journey from it. From Bokhara, the road to Cashgar lies through Tahkund, still more northerly than Cashgar. Hence, if the direction of the road be north-east for 11 days out of 25, the distance of Cashgar from Samarcand, and 14 out of 30 from Bokhara, nearly N.E. by N., it furnishes a strong presumptive proof that the direction of the whole line is very far to the north of east. The only line of distance that would aid us in ascertaining the latitude of Cashgar is that given by Bernier, (vol. ii. ktt. 9.) in which it is stated, that the distance of Cashgar from Cashmere is 44 journeys, through Little Thibet; but that a shorter road lay through Great Thibet; and these journeys, though not so expressed, may be understood to be those of a caravan. Such journeys, says Mr. Rennell, on a distance that requires 44 days of travelling, cannot, in any country, be taken at more than 14 geographical miles of direct distance each day; and through such countries as those between Cashmere and Cashgar, perhaps at 12 or 12 only. The distance, according to this proportion, would reach to the parallel of 43° 44'; on a supposition that 7½ or 8 degrees of longitude were allowed between Samarcand and Cashgar; but even if 9 or 10 were supposed, the bearing line from Cashmere is so nearly meridional, that two degrees of longitude would make a difference of a few minutes only in the latitude assigned to Cashgar. Hence it may be generally inferred, that Cashgar cannot be in a lower parallel than 43° 44'; and then, admitting either of the distances from Samarcand and Cashgar; but even if 9 or 10 were supposed, the bearing line from Cashmere is so nearly meridional, that two degrees of longitude would make a difference of a few minutes only in the latitude assigned to Cashgar. 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of Aia, situate at the northern extremity of Hindooftan, northward of Lahore, and reftituted to a valley of an oval form, surrounded by hills, which has its largeft extent from S.E. to N.W., or more strictly, from S.E. by E. to N.W. by W. Mr. Forther reckons its dimensions 85 British miles by 40. Mr. Renfaw affirms that the deftimate of 80 miles for the length of the flat part of the valley, does not exceft the truth by more than a very few miles; for he fays, that 74 or 75 can be clearly made out. But its breadth is fuppofed to be 52 miles, or more; for Heerapour, at the entrance of the valley from the fide of Bembar, or the fouth side, is nearly 25 British miles acrofs from Sirinagur; and Lar, according to Bernier, is about as far from Sirinagur as Barehooloo is, i.e. 27 British miles; but as Sirinagur does not lie directly between Heerapour and Lar, a confiderable angle takes place, and may probably reduce the 2 miles to 50 in direct distance. In the Ayin Acharace, Cashmere is divided into two parts, viz. "Meerae" and "Kamaeja," the former being the eafier part, and containing the districts ftituated to the E., the S.E. and the N.E. of Sirinagur; and the latter, the western part, containing the N.W. and S.W. districts. On the fourth call of Sirinagur, at fome distance beyond the great circle of mountains that surrounds the valley of Cashmere, is the district of Benhal. With regard to its general poftition, Cashmere is bounded on the weft by the district of Puchkhol; on the S.W. by the territory of the Glickers; on the S.E. and S. by that of Jammoo and Kihrewar; and on the E. by the river Chunaub. On the N.E. lies Great Thibet, fpared from it by the fummit of mount Kantel; and on the N.W. is Little Thibet. Tradition reports, that the fite of this valley was formerly a lake; nor is this at all improbable. It is fuch an effect as might be expected, in every cafe where the waters of a river are inclofed in any part of their course by elevated lands: and with refeft to the river Behut in the prefent inftance, it appears that the lake exifted long enough to deposit a vall depth of foil before it difperfed. The Cashmerian hiilory names the lake "Sutty-Sirr," and adds, that Kutup led a colony of Bramins to inhabit the valley, after the waters had fpolded. Cashmere, previously to the Mahometan conqueft of India, was celebrated for the learning of its Bramins, and the magnan-"me conftruction of its temple. Although we are not able to affertain the period of its fpcription to the M hometans, yet it is reafonable to fuppofe, that a country supplying articles of valuable commerce, and furnifhing a profition of natural beauties, would at an early date have excited their notice, and invited their conqueft. It was governed for a long feries of years by a race of Tartar princes of the Jaga-"tay or Zagarbay tribe, until the year 1586, when it was fpolded by Akbar, more, as it is faid, by intrigue than by the force of arms. After having been annexed to the houfe of Timur for 160 years, it was betrayed by the Mogul govern-"or to Ahmed Shah Duranm, who formed it into a pro-"ince of the Afghan empiue. Cashmere is tributary to the fultan of Cabul, and at the period of Mr. Forther's re-"idence, (A.D. 1783,) it was governed, or rather defolated, by his viceroy. See CANHAR.

The valley, or country of Cashmere, is celebrated throughout Upper Aia for its romantic beauties, the fertility of its foil, and the temperature of its atmosphere. Nor is its excel-lence in these repects to be questioned, when we confi-"der that it is an elevated and extensive valley, surrounded by steep mountains that tower above the regions of fnow; and that its foil is compofed of the mud depofited by a capital river, which, as we have already faid, originally formed its waters into a lake, that covered the whole valley, until it opened itself a passage through the mountains, and left this fertilized valley an ample field to human induftry, and to the accommodation of a happy race; for such the ancient inhabi-"tants of Cashmere undoubtedly were. The author of the Ayin Acharace dwells with rapture on the beauties of Cashmere; and on this account it was visited by Achar and by other empe-rors of Hindooftan, who during the summer heats used to retire thither for the fake of enjoying a cool and refreshing climate, and who feemed to forget the anxieties of government during their refidence in this "happy valley," "this garden in perpetual spring," "this paradise of India," as it was denominated by the multitude of its admirers. It ap-"pears that the periodical rains which almost deluge the reft of India, are that out of Cashmere by the height of the mountains, fo that only light flowers fall there; and yet there are fo abundant as to feed fome thousands of cafes, which are precipitated into the valley from every part of the fpandous and romantic bulwark that encircles it. The foil is the refbft that can be conceited; and its productions are thofe of the temperate zone. As it has generally a flat surface, copiously watered, it yields abundant crops of rive, which is the common food of the inhabitants. At the bafe of the surrounding hills, where the land is higher, whea,-"barley, and various other grains are cultivated. A superior species of faffron is also produced in this province, and iron of an excellent quality is found in the adjacent mountains. But the wealth and fame of Cashmere have been chiefly owing to its manufacture of fhwals, which are unrivalled, and which are distributed all over the western and southern parts of Aia. The delicate wool of which thefe fhwals are made, is the produce of a species of goat, either of that country, or of the adjoining one of Thibet. It is originally of a dark grey colour, and is bleached in Cashmere by the help of a certain preparation of rice flour. The yonf of the wool is flained with fuch colours as may be judged the bell suited for fale, and after being woven the piece is once washed. The border, which ufually displays a variety of figures and colours, is attached to the fawl after fabrica-"tion; but in fo nice a manner, that the junction is not visi-"ble. The texture of the fawl refembles that of the haloon of Europe, to which it has probably communicated the name. The price of an ordinary fawl, at the loam, is eight rupees; and thence, in proportional quality, it produces from 15 to 20; and fome have been fed at 40 rupees the fawl. But the value my be very much enhanced by the introduction of flowered work; and hence the weaver occa-"fonally receives for a single fawl the sum of 100 rupees. These fhwals initially confift of three fizes, two of which, the long and the small square one, are in common use in India; the other, long and very narrow, with a large mixture of black colour in it, is worn as a girdle by the northern Aftics. A portion of the revenue of Cashmere is transmitted to the Afghan capital in fawl goods. The manufacture, however, is declind to one-fourth of the former quantity; which may be ascribed to the decline of the Persia and Hindooftanie empires. In this diffrcit are fheep, called "hudoo," which, like those of Peru, are employed in carrying burdens. A wine is made in Cashmere refembling that of Madeira; and a spirituous liquor is also diffilled from the grape, in which, as well as the vine, people of all classes freely indulge. The Cashmirians fabricate the bell writing paper of the East, which was formerly an article of extensive traffic; as were also its lacquer ware, cutelry, and fufges; but the heavy oppreffions of the government, and the rapac-iity of the bordering fates, which prey upon the foreign traders and often plunder whole cargoes, have reduced the commerce of Cashmere to a declining and languid state. In proof.
proof of this fact, the Cashmirians say, that during their subjection to the Mogul dominion, the province contained 45,000 shawl looms, and that at this day there are not 15,000. In Cashmere are seen merchants and commercial agents of most of the principal cities of northern India, also of Tartary, Persia, and Turkey, who at the same time advance their fortunes, and enjoy the pleasures of a fine climate and a country, over which are profusely spread the various beauties of nature. The country is plentifully watered by a number of streams and rivers, which bring their tribute to the Beutu, (which see,) the parent of the soil; and many lakes are spread over the surface, some of which contain floating islands. The whole country indeed resembles a garden intermixed with towns and villages, varied with beautiful trees, green meadows, fields of rice, hemp, labor, and different legumes, and intersected by canals winding through them in all forms. The scenery is in a high degree picturesque; and a portion of the romantic circle of mountains forms a part of every landscape. The pardonable superlition of the sequestered inhabitants has multiplied the places of worship of Mahadeo, of Bihen, and of Drama. Cashmere is altogether holy land; and it abounds with miscellaneous fountains. However, they are obnoxious to one dreadful evil, which is the frequent recurrence of earthquakes; and in order to preserve themselves from their injurious fatal effects, all their houses are built of wood, which the country supplies in great abundance. The annual public revenue of Cashmere, in the time of Aurungzebe, appears to have been only about 35,000l. In the time of Shah Jahan the actual and realized revenues were about 25,000l. and only 20,000l. in the time of Mahomed Shah. A revenue, says Forster, of between 20 and 30 lacs of rupees is collected from this province, of which a tribute of seven lacs is remitted to the treasury of Timur Shah. The army of Cashmere consists of about 3000 horse and foot, chiefly Afghans, who are poorly paid, and who for want of better subsistence were under a necessity of living on the kerf of the finger, or water-nut, which is plentifully produced in the lakes of this country. The drefs of the Cashmirians consists of a large turban, a great woollen veil with wide sleeves, and a fall wrapped in many folds round the middle under the veil, which may be properly called a wrapper, people of the higher class wear a phiran, or shawl, and drawers; but those of the lower order have no under garment, nor do they even grid up their loins. The drefs of the women is no less awkward than that of the men. Their external, and often only garment is of cotton, and shaped like a long loose skirt; over the hair, which falls in a single braid, they wear a close cap, tufted with woollen cloth of a crimson colour; and to the hinder part of it is attached a triangular piece of the same colour, which falling on the back conceals much of the hair. Around the lower edge of the cap is rolled a small turban, fastened behind with a short knot, which seems to be the only artificial ornament about them. The women of the higher classes are very abstemious. The Cashmirians are stout, well-formed, and as the natives of a country lying in the 34th degree of latitude, may be termed a fair people; and their women in southern France and Spain would be called brunettes; but their figure is coarse, their features broad, and their legs often thick. They are generally gay and lively, and much addicted to pleasure, although the Afghan government has somewhat depressed their spirits. Young and old have a taffe for mofic. Mr. Renell says they have a language of their own, said to be anterior to the Sanscrit; but according to Mr. Forster, it is evidently derived from the Sanscrit, and resembles in sound that of the Mahbrattas, though more harsh; on this account the inhabi-
the rough, and the purified or reduced; the latter is a composition of purified calhoo, mixed with aromatic drugs, and made into lozenges. This calhoo is made for the use of the Indians, who chew it either alone, or mixed with pinang or areca. Rough calhoo is a commodity which is brought down the Ganges as far as Bengal; whence it is distributed throughout the Indies, where there is a great consumption of it; and to the Europeans, who fend it into Europe. What is sent into Europe, however, is mostly purified; for calhoo is not used rough any where.

Calhoo is much valued in medicine: among other effects ascribed to it, is the stopping a cough, and strengthening the stomach; beside which it sweetens the breath, when being reduced to an impalpable powder, mixed with amber-grafe, and mucilages of gum adragant, it is made into pills. Calhoo must be chosen of a tanned red on the outside, of a bright red within, very fining, and not burnt. Kempfer observes, that they prepare at Odowara perfumed calhoo, of which they make pills, small idols, flowers, and other figures, which they put into little boxes for sale. The women are very fond of it, and use a great deal of it, because it palpates the teeth, &c. The thickened juice is carried to Japan, by the Dutch and Chinefe; and after it has been prepared at Macao, or at Odowara, they buy it again, and carry it to other places.

CAS, in the Persian Policy, one of the two judges under the nadab, who decide all religious matters, grant all divorces, and are present at all public acts; having deputies in all cities of the kingdom.

CASI OA, in Botany, fructu nigro, Amm. Ruth. See Nitraria fruteberti.


Casia, in Ancient Geography, a country which the ancients placed near mount Imaus in Scythia. M. D'Anville places it in the angle formed towards the west by the two chains of mountains, which he calls Imaus, one of which is to the north-call, and the other declining to the south-call. This country corresponds to the present Casciar; which see.

Casia, a promontory on the coast of Carmania, at a small distance from the mouth of the river Hydracius.

CASAAR, or CASAREA, in Geography, a town of Asia, on the coast of the Mediterranean, in Palestine; anciently called Casarea Stratonitis, which see. In the year 625, it was taken by Omar, one of the succerores of Mahomet, and was alternately in the possession of the Chrisfians and Mahometans during the religious wars, till it was finally left, with the loss of its ancient splendour, in the power of the latter.

CASI, or CASI Montes, in Ancient Geography, a chain of mountains in Asia, situate in Secria, to the south of Armenia, and of Issedon Secria, according to Ptolemy.

CASILINUM, a river of Italy, in Campania. The town of Casilium was seated on the opposite banks of this river, and a bridge connected its two parts. Agathias says, that this river descended from the Apennines, and discharged itself into the Tyrrhenian sea.

CASILINUM, a town of Italy, in Campania, N.W. of Capua, seated on the Vaviturnus, at a considerable distance from the sea. It once occupied both sides of the river. During the fierce Punic war it distinguished itself by the resistance which its garrison made to Hannibal. Julius Caesar established a colony in this place. Modern Capua was built on its ruins. See CAPUA.

CASIMERSBURG, in Geography, a town of Germany, in the circle of Upper Saxony, and district of Pomerania.

CASIMIR, in Biography and History, the name of several kings of Poland.

CASIMIR I. was the son of Mieszlaus II. and at the death of his father, in 1034, was placed under the tutelage of his brother, Rixfa, who was appointed regent of the kingdom. The Poles, aggrieved by his oppressive administration, revolted, and expelled both him and his son. Casimir took refuge in France, and, having a propensity to literature, studied in the university of Paris; and, when the sovereign orders, he became a monk, first in Italy, and afterwards in the abbey of Chun, in France. Poland, having suffered much during the interregnum, the nobles of the country discovered the place of Casimir's retreat, and recalled him from his exile; but it was necessary that he should be released from his clerical vows; for which purpose, a dispensation was obtained from the pope, on condition of the payment of Peter-peece by the Poles, and some other stipulations favourable to the holy see, and he was then crowned with unusual solemnity, in 1049. By marrying the sister of Jafferus, grand duke of Rufia, he secured peace from that quarter; and by the vigour of his government, he suppressed the banditti who had infested the country, and restored law, order, cultivation, and prosperity to Poland. He civilized his subjects by the establishment of churches and monasteries, and by encouraging the arts of peace he made his kingdom flourish to a degree before unknown. In 1044, he quelled the rebellion of Maltus, who had risen from the rank of a private soldier to the highest offices of the state, and who at last assumed the title of prince of Mazovia. He also expelled the Bohemians from Silefia, and established an episcopal see at Breslaw. After an honourable and happy reign of 18 years, he died, in 1058, much regretted, and left the crown to his son, Bolechis.

CASIMIR II. surmamed the Jad, was the youngest son of Bolechis III., who, at the death of his father, in 1123, was left an infant in the cradle, without any provision. In mature age, he was advanced to the dignity of prince of Sandomir; and, as an evidence of the property with which the appellation of Jad was bellowed upon him, the following anecdote is recorded: Having won at play all the money of one of his nobility, the loser, incensed at his ill fortune, struck the prince a blow on the ear. The offender instantly fled; but being pursued and taken, he was condemned to lose his head. Casimir interposed. "I am not surprised," said the prince, "that, not having it in his power to revenge himself on Fortune, he should attack his favourite." He revoked the sentence, returned the nobleman his money, and declared that he alone was faulty, as he had encouraged, by his example, a pernicious practice, that might terminate in the ruin of his people. The Poles, dissatisfied with the conduct of his brother Mieszlaus III., deposed him, and elevated Casimir to the throne, in 1177. The new sovereign proved himself worthy of the honour, by subduing the Lower Poland and Pomerania, abolishing all exorbitant imposts, reforming the abuses of his predecessor's administration, and restoring rights and privileges that had been alienated from their possessors. The brother of Casimir, deprived of his crown, and reduced to a state of extreme indigence, supplicated compassion; and so far succeeded, that the reigning prince determined to evacuate the throne in his favour, and pledged himself for his future good conduct; but the lates, to whom Casimir applied for permission to reign, peremptorily refused it. He conformed, however, at the irregularities of his brother, and particularly at his taking forcible possession of Gneina and Lower Poland, where he might have lived in splendour and
and in peace. But his restless spirit led him to extend his encoemantments, and he perfilled in his endeavours to wrest the crown from his brother. It became necessary, at length, to restrain his usurpations; and to compel him to evacuate all his conquests. The last enterprise of this prince was a kind of pious crusade against the relapsed heathen of Prussia, whom he subdued rather by the reputation of his wisdom and generosity than by force of arms. Soon after his return to Cracow from this expedition, he died, in 1410, after a reign of 17 years, lamented as the most amiable prince that had ever filled the throne of Poland. With his distinguished virtues, however, he blessed culpable foibles.

In his palace he was the flower of his minstrelies.

Casimir III., surnamed the Great, succeeded his father Uladislaus III. in 1323, and soon after his accession engaged in a contest with the Teutonic knights, who obtained the support of the kings of Bohemia and Hungary. His subjects wished him to vindicate his claims and punish the usurpation, perfidy, and turbulence of these knights, by declaring war against them; but Casimir, fertile of his power, thought it most prudent to wait for a more seasonable opportunity, and acquiesced in the retribution of Cum and Cujavia. At this time he had another more important object in view than that of regaining Pomerania, which had been adjudged by the royal umpires to the knights; and this was the conquest of the province called Black Russia, which, together with Volhina and Mazovia, he completely subdued and annexed to his Polish dominions. Having accomplished this object, he directed his attention to the civilization and improvement of his country. Accordingly, he first gave the Poles a regular code of written laws, such as had never before been seen in Poland, which he caused to be observed by all ranks of people, and he thus introduced justice and order in the room of arbitrary decision and undefined extortion. This written code he pe rented to a general diet, where it was examined, approved, and enlarged. He also strengthened the frontiers of the country by fortresses, inclosed the chief cities of his dominions with walls, built churches, founded monasteries, and purloined every measure that was likely to conciliate the affection and attachment of his subjects, and to increase the wealth and prosperity of the kingdom. His incontinence cast cloud over his other virtues; and he incurred peculiar reproach by fluttin up one of his wives in a monastery that she might not interrupt his licentious intercourse with a favourite concubine. His works of piety and charity recommended him to the favourable judgment of the clergy; and they not only extenuated the criminal indulgence of hisrul ing passion, but lavished upon him the highest encomiums. He was thrice married, but left no children; he was the laft Polish king of the direct line of the Piasts. His death, which happened in 1370, at the age of 60 years, and after a reign of 37, was occasioned by a fall from his horse in hunting.

Casimir IV., the second son of Jagello, was grand duke of Lithuania, when, in 1445, his brother Uladislaus was killed in the battle of Varna against the Turks, and was crowned as king of Poland, in 1447.

The first operations of his reign were directed against Bogdan, who usurped the vadechop of Moldavia, whom he obliged to flee for peace. He afterwards undertook the protection of the Prussians against the tyranny of the Teutonic knights, whom he expelled from many of their cities. But whilst his army covered the siege of Marienburg, the knights attacked his camp with great impetuosity, and constrained him to secure himself by an ignominious flight, after 4000 of his troops had been slain or taken prisoners. In consequence of this defeat, he returned to Poland, and, having recruited his forces, he resumed the siege of Marienburg and took it; and thus humbled the knights to such a degree, that, by a treaty of peace concluded at Thorn, they ceded the territories of Cula, Michlow, and the whole duchy of Pomerania, together with the towns of Elbing, Marienburg, Tallmitz, Schutt, and Chriftburg, to the crown of Poland. The king, in return, restored to them all his other conquests in Prussia; granted a seat in the Polish senate to the grand-masters; and indulged him with other privileges, on condition that six months after his accession, he should do homage for Prussia, and take an oath of fidelity to the king and republic. Such were the conditions on which Casimir terminated the war, and humbled an order which had given perpetual disturbance to the northern hemisphere, for nearly the space of two centuries. Moldavia was also made tributary to Poland; and when the crown of Bohemia became vacant, the barons bullied it upon Uladislaus, the eldest son of Casimir, in opposition to the intrigues of Matthias Corvinus, the king of Hungary, whom Uladislaus pursued into his own country, and defeated. Thus the three crowns of Poland, Hungary, and Bohemia, were united in the same family, and Casimir's power was greatly augmented, though the felicity of his people, oppressed with grievous taxes, and diminished in number by a variety of bloody engagements, did by no means increase in the same proportion. Casimir wished to retrieve his domestic affairs by the arts of peace; but before he could accomplish his purpose, he died, at the age of 64, in the year 1430, more admired than beloved or regretted. In this reign the deputies of the provinces first appeared at the diet, and assumed to themselves the legislative power; all laws before this period having been framed by the king, in conjunction with the senate. Casimir is also said to have published an edict, enjoining the study of the Latin tongue, in which both he and his subjects were before grossly ignorant, and thus he rendered this language ever since almost vernacular among the gentry of Poland.

Casimir, John, second son of Sigismond III., king of Poland, was originally destined for the church, and entered the society of the Jesuits, after having visited most of the courts of Europe. From pope Innocent X. he had obtained a cardinal's hat; but upon the death of his brother Uladislaus VII. in 1648, the Poles elected him to the crown. Upon his accession he expressed his disapprobation of the measures which had irritated the Cossacks and excited them to rebel; and, after some actions with them, he concluded a treaty of peace which was much in their favour. Afterwards the war was renewed; the Cossacks were defeated, and again obtained a peace, which occasioned dissatisfaction to the nobility. In 1653, the Cossacks availed themselves of the hostile disposition of the Cossacks, and of the divisions that subsisted between Casimir and the Polish nobility, to commence hostilities against Poland; and, uniting with the Cossacks and Tartars, entered Lithuania, ravaged the country, and treated the inhabitants with great barbarity. At the same time Charles Gustavus, king of Sweden, invaded Poland by the way of Pomerania, and, reducing the whole country as he advanced, with Cracow its capital, obliged the unfortunate Casimir to seek an asylum in Sileia. Casimir's flight being interpreted by the Poles as an abdication of the crown, they took an oath of allegiance to the conqueror; and Gustavus became master of all Poland and Prussia, the city of Danzig excepted. The impositions of the Swedes, aided by the exactions and example of the clergy, roused again a spirit of resistance. Casimir was privately invited to return to his dominions; and he immediately put himself at the
the head of a considerable army, assembled by the nobility. The Tartars formed an alliance with the Poles, and, attacking a body of Swedes, totally defeated them. The Lithuanians also revolted from the Swedish monarch, and, taking advantage of the dispersed condition of his soldiers, attacked and massacred them before they could unite and form themselves into a body for their own defence. Gullava, however, procured the war, and took Warsaw by storm; but at length he was obliged, in 1657, to withdraw his army from the Polish territories, and to employ it in the defence of his own country, which was attacked by the Danes. Soon afterwards the Swedes were under a necessity of wholly evacuating Poland. After the death of Gullava, Casimir made a peace at Oliva, in 1660, with Charles XI. his successor, upon condition that he should renounce all claim to the Swedish crown, and that the Swedes should restore all their conquests in Poland, Prussia, and Livonia, Riga and a few other places excepted. Peace being thus established between the Poles and the Swedes, Casimir determined to commence a war with the Russians, who had made divers incursions into his dominions; and having succeeded in two decisive engagements, he led siege to Wilna, the capital of Lithuania, which had been taken by the enemy during the late war with Sweden. The siege was protracted till diffusions occurred between the king and some of the nobility, who inflamed that he should dismiss his German mercenaries, under a plea that they were introduced to deprive the liberties of the republic, and not to recover her territories. The animosity produced an open variance; forces were raised on both sides; a battle ensued; the royal party was defeated; and the contest terminated with the dismission of the German levies. Upon this compliance on the part of Casimir, the discontented party threw off the mask, lost all respect for the person of the king, and occasioned to him so much vexation, aggravated at the same time by the loss of his wife, who had been his brother's widow, that he reneged the crown in dignily, A.D. 1668, and retired to France, where he was honourably received and hospitably treated by Lewis XIV. He died at Nevers, in December, 1672, and a magnificent monument was erected for him at the church of the Abbey of St. Germain des Prés, of which he was abbot. The turbulent reign of John Casimir gave rise to the privilege assumed by each single nuncio at the diet, of putting a flop to any public affair by his negative, called the "librum veto! a fruitful source of anarchy and violence. Mod. Un. Hist. vol. xxx. Moreci.

Casimir, Matthias Sarbesskyi, a Polish Jew, and an excellent Latin poet, was born in 1597; and, in the judgment of M. Baillet, he is an exception to a general maxim of Aristotle and others among the ancients, which teaches us to expect nothing ingenious and delicate from the northern climates. His odes, epodes, and epigrams, have been thought not inferior to some productions of the finest wits of Greece and Rome. Grotius, D. Heinrichs, and others, have not scrupled to affirm, that he is not only equal, but sometimes superior, even to Horace himself. Such was the respect which he entertained for Virgil, that he had begun to imitate him in an epic poem, called the "Lefciade," which he had divided into 12 books. But his death, which happened at Warsaw in 1640, put a stop to his progress in this work. His epigrams, however, are allowed to be much inferior to his odes. We have a translation of one or two of his small pieces in Dr. Watts's lyric poems. There have been many editions of his poems, the best of which is that of Paris in 1759.

Casimir, in Geography, a town of Poland, on the Vistula, on the side opposite to that of Cracow, from which it is only separated by a bridge, built by king Casimir the Great, for a university, which contains 11 colleges and 14 schools.

Casinates, in Ancient Geography, the inhabitants of the town of Caunum, which fea.

Casini, among Hunters, denotes the flippin off the skin of a hare, fox, or badger. They say, "lay a dear, cast a hare, and all sorts of vermin. This is done by beginning at the front or nape of the head, and afterwards his skin over his ears down to the body, and the very tail.

Casing of Timber-work, is the planter of a wooden house all over on the outside with mortar, and dividing it, yet wet, by a riler, with the corner of a trowel, or the like instrument, to make it receive the joints of free-stone; by which means, the whole house appears as if built thereof. It is best done on heart-laths, because the mortar is apt to decay the lap-laths in a short time. It is commonly laid on at two thicknesses, the second before the first is dry.

Casings, a provincial term applied to dried cow's dung, which is used in several parts for fuel.

Caso, in Geography, a river of Italy, which runs into the sea, 2 miles N.W. of Cape Stilo.

Casinum, in Ancient Geography, a considerable town of Italy, in Latium, upon the Latin way from Campania. Hannibal encamped two days under its walls. After the wars of the Samnites, under the confuente of M. Valerian and Publius Decius, the Romans, having made themselves masters of Caunum, sent a colony thither in the year of Rome 442. Its ruins are visible near Sab. Germaino.

Casinus, a river of Italy, which, according to Strabo, joined the Iltis at the place where was situated the town of "Interamnus." It is suppos to have been the present Saco.

Castrorum Insulae, small islands situate near the small island of Casus, to the south of the island of Carpathus.

Casirotæ, a people of Asia, who inhabited the territory N. of Aria, on the side of Drangiana, according to Ptolemay.

Casius, the name of two mountains of Phoenicia, one to the south, on the frontiers of Egypt, the other to the north, near "Seleucia Pieria," to the right of the mouth of the Orontes. The term "Causus," in the Eastern language, denotes limit or boundary, and the situation of these mountains, in their relation to Phoenicia, justifies this etymology. The mount Casus of Syria (see Pliny, N. H. 1. v. c. 22.) was situated to the south of the mouth of the Orontes, near Seleucia to the south-west. The present mount Casius rises above Antioch to a prodigious height; but Pliny furiously hyperbole when he says that from its summit we may discover at once both the morning's dawn and the evening twilight. The mount Casius that lay on the frontiers of Syria and Egypt was situated on the northern coast of the island of Suez, and was distant, according to Strabo, 300 stadia from Pelusium. According to this geographer (1. xvi. vol. ii. p. 1102.) it resembled heaps of sand, and projected into the sea. On this mountain the body of Pompey the Great was deposited; and it had a temple of Jupiter, named Casius. Jupiter has also a temple, under this application, on mount Casius in Syria, near Seleucia, as is evident from the effigy of the inhabitants thither every year to celebrate a feast in honour of Triptolemus. He was also worshipped under this title at Callisope, a city in the island of Coreya, situate on the westernmost cape of the island, and nearest the main land. Suetonius represents Nero as landing on
on this point, and singing before the altar of Jupiter Catus.
There are medals full extant, which exhibit Jupiter with
these inscriptions,  "ZCYC KACIOC," and  "ZSYE
KAYOCT," excreptive of this legend.

Catus, a river of Albania, mentioned by Pliny and
Plutarch; and the mouth of which is placed by the lat-
ter between those of Gheusus and Albarion.

Cask, in French  "caiss", a head-piece or helmet, a
defensive armour for covering the head and neck. For-
erally all the gene d'armes of France wore  "caisse".
The king had one gilt with gold, the dukes and counts had
their with silver, gentlemen of extraction wore them of
polished steel, and the rest of plain iron. The word is
commonly supposed to come from  "caissa", the Latin term for
a helmet.

The Romans had their caiques of brass or iron, which
were proof against the strokes of any sword or saber, and
were ornamented to the height of two feet with plumes of
feathers, or tufts of horse hair, of different colours, which
made them look grander and taller, and struck more terror
into their enemies. The chief and principal officers wore
caiques gilded and enriched with precious stones, with the
tops of them ornamented with plumes and argent of value,
which served to distinguish them from others. The Skandi-
navians, and other people of the north, used to wear them,
and the invention of them is ascribed by some to the Sey-
thians and the Celts. It is supposed, however, to have been
one of the most ancient of all coverings for the head, and it
is frequently seen on ancient medals in a variety of forms or
fashions, as the Grecian, the Roman, &c. Kings and
emperors wore it; and even the gods themselves are figured as
wearing it. That which covers the head of Rome, has gen-
erally two wings, like those of Mercury. Those of some
kings are furnished with horns, like those of Jupiter Ammon,
whilst those of some others have only bulls' or rams' horns,
to denote their uncommon strength.

Cask, in Heraldry, the same with helmet.

Cask is also used as a common name for vessels of
divers kinds; in contradistinction from the liquor, or other matter
contained therein. Thus a hoghead of spirits, &c. is said to
weigh 4 Cwt. 1/3 and 22 lb. cask and liquor; a tuncheon, 6
Cwt. 1/4 and 2 lb. cask and liquor. See Tun, &c.

Cask of Sugar, is a barrel of that commodity, containing
from eight to eleven hundred weight.—A cask of almonds is
about three hundred weight. No one shall transport any
wine cask, &c. except for vitualling ships, under a certain
penalty, by 35 Eliz.

For the method of imitating the solidity or content of a
cask, see  "Frustum of a Pyramid," and  "Gauging."

CASKET, in a general sense, a little coffier, or cab-
inet. See Cabinet.

Caskets, in Geography, two high rocks at W. by N. and
W.N.W. from the W. end of Aldey, and besides many
smaller ones, several of which are covered by the flood-tide.
On the westermost of the Caskets there are three little
houses, disposed in a triangular form. N. lat. 40° 45' 30".
W. long. 2° 24' 40". High water at spring-tides at 9
o'clock. See Alderney.

Caskets, in Sea-Language, are small ropes made of sinnet,
and fastened to gromets, or little rings upon the yards;
their use is to make fast the fail to the yard when it is to be
furled.

Caskets, breadth, are the longest and highest of these, or
those in the midst of the yard, betwixt the ties.

CASLEU, in the Hebrew Chronology. See Cislue.

Caslon, William, in Biography, an eminent letter-
founder, was born at Hales Owen in Shropshire, in 1672;
and having served an apprenticeship to an engraver of orna-
ments on gun-barrels, he embarked for himself in this busi-
ness in London, connecting with it the manufacture of tools for
the book-binders, and for the chasing of silver plate. Whilst
he was thus engaged, he became acquainted with the elder
Mr. Bowyer, who introduced him to a foundry; and being
furnished with his abilities for undertaking the business of cut-
ting types, though he had never before seen it performed,
he concurred with two other eminent printers (Mr. Bettau-
man and Mr. Watts) in advancing the sum of 500l. towards
enabling him to commence the undertaking. Accordingly
he immediately applied to it with singular facility and suc-
cess. In 1720, the society for promoting Christian knowledge
proposing to print, for the use of the Eastern churches, in Pak-
tein, Syria, Mesopotamia, Arabia, and Egypt, where printing
was not allowed, the New Testament and Psalter in the Ara-
bic language, engaged Mr. Caslon to cut the font of letter;
in his specimens of which he distinguished it by the name of
"English Arabic." Having finished this font, he cut the
letters of his own name in "Picar Roman," and placed them
at the bottom of one of the Arabic specimens. When Mr.
Palmer, the reputed author of the "History of Printing"
(which was in fact written by Philmanazar), saw the
name, he advised the artifiq to cut the whole font of Picar
in the execution of which he surpassed the other founders of
the time. Mr. Palmer afterwards repeated of the advice he
had given him, and dreading the competition of such a for-
dable rival, endeavoured to discourage his further progress.
Mr. Caslon, distrusted by this treatment, applied to Mr.
Bowyer, and under his inspection he cut, in 1722, the bea-
"tiful font of "English," which was used in 1726, in print-
ing Selden's works, and the Coptic types that were made
use of for Dr. Wilkins's edition of the Pentateuch.
Under the further encouragement of his three first patrons, he
proceeded with vigour in his employment, acknowledging his
particular obligation to Mr. Watts as his master, from whom
he had learned his art. Such was the perfection to which
he attained, that it was no longer necessary to import types
from Holland; and his own were so beautiful and elegant,
and so far exceeded the productions of the best arti-
ciers, that they were frequently exported to the continent.
A more beautiful specimen than his, it has been justly said, is
not to be found in any part of the world. After some
previous changes of habitation, he settled, viz. in 1735,
establihed his foundry in Chiswell-street, where in proces-
t of time it became the most capital of any existing in this or in
any foreign countries. Having acquired opulence in the
course of his employment, he was introduced into the com-
munication of the peace for the county of Middlesex; and to-
wards the close of his life, devolving the active part of his
business on his eldest son, he retired to Bethnal green in the
vicinity of London, where he died in January 1766 at the age
of 74 years. Mr. Caslon was universally esteemed as a frati-
rate artist, a tender master, and an honest, friendly, and be-
nevolent man; and Dr. John Hawkins (Hift. of Music, vol. v.)
has particularly celebrated his hospitality, social qualities,

CASLUHIM, in Scripture, Geography, one of the na-
tions descended from Mizraim, who are supposed to have settled
somewhere towards the entrance of Egypt; about mount
Caius, in that part of the Lower Egypt called Calotis by
Ptolemy and others, which places, it is thought, retain some
likeness of the name; but, without relying on that argument,
they appear to have been planted near the Caphtorim, be-
cause the Philistines seem to have been descended from both
these people, and consequently to have been settled in Egypt.
Bochart, misled by following the Jewish notion about Caphtor,
fancies
fancies them to be the inhabitants of Colchia, at present called Mungrelia.

CASMA, in Ancient Geography, a town mentioned by Ptolemy, and placed in the eastern part of Mauritania Cezarensis between Aques Calidus and Ida.

CASA LA BAREA, in Geography, a town of South America, in the country of Peru, and jurisdiction of Santa Catarina, or Caxama part is 4 leagues N. from Morgon, and 11 S.E. from Arequipa, or the coast of Peru, in the South Pacific Ocean. S. lat. about 9° 40'. This is a good harbour, though subject to hard gales.

CASCHEMA, a town of Sicily, placed by some near the source of the Hippatis, and by others between Arca and Camarina. This city, according to Theophrastus (v. i. c. 75) was built by the Syracusians 92 years after Syracusa, or about the year 668 B.C.

CASMONEA, a people of Italy, who inhabited the mountains of Liguria. Pliny.

CASOAR, in Ornithology, the French name of the cai-son, or Cassius. (Bopp.) See STRUTHIO CASARUS.

CASOLI, in Geography, a town of Naples, in the province of Abruzzo Citera; 15 miles S.S.E. of Cività di Chieti.

CASOS, or CASUS, CASO, an island of the Mediterranean, one of the Cyclades, is laid to have received its name from Cafl, the father of Cleomachus. This little island lent a colony to mount Caflus, dependent on Syria. According to Strabo, it is distant from Carpathus, now called Scarpanto, 70 stadia or 24 leagues, and 250 stadia, or 9 leagues, from Samos, a promontory of Crete. It is 80 stadia, or 3 leagues, in circumference; on it was formerly a town of the same name, which no longer exists, and round it are several smaller islands. The population of this island at the present time is not considerable; and entirely composed of Greeks, though subject to the Turks. It is little frequented by shipping, its road being difficult of entrance, and more dangerous of access. The inhabitants, however, are on that account more happy and more free; as the Turks fielded venture to go thither to exercise the despotic with which they oppress the countries subject to their dominion. The Greeks of Caffo, being more independent and more secure in their property, are more laborious than others; their toil and industry have introduced fertility on a foil of which the flattest even of vegetable earth, which covers the rocks, appeared not to render it susceptible; the vines which grew on this sandy ground, furnish them with very good wine; and the honey, which they gather, is still, as in ancient times, abundant, and of an excellent quality. The Caffians, like all the inhabitants of the small islands which cannot supply the wants of their population, are navigators and traders; but their industry in that way does not extend beyond the limits of the Archipelago. The women of the island wear a jacket, fash, and long robe of cotton; the only difference consisting in the embroidery, which varies according to their different tastes, and in the manner of wearing their hair, which some发音 to flow upon their shoulders, in one or more tresses, and others fasten to the crown of the head, letting it fall down again upon the neck. Their employment is that of spinning cotton and embroidery, and making the fine linens which they wear. Several of them are handloom, and their amusements are dancing and music. The men, during the spring, summer, and part of autumn, are out at sea, so that the island seems to have few males. Their trade to different islands of the Archipelago, and return from time to time with provisions for their families, and only pass the winter with them. They sow the land with barley and wheat at the commencement of the rainy season, which lasts from October to February; collect the harvest in March, and then return to sea, supplying from other countries the deficiency of the produce of their own island. The cultivated part of the island is divided into compartments, and shared among the Caffians. The town is not continual in the above-mentioned months, but some falls in any other; during the remainder of the year the air is pure and serene, and both days and nights fine and clear. The heats are moderated by the fresh breezes, and beneath a beautiful sky, the inhabitants enjoy a delightful temperature, and are almost insensible to every kind of disease. The men enjoy their repasts, consisting of poultry, eggs and rice, and good wine, dining together seated in a circle on the carpet, and the women in a separate apartment. Savary expresses his admiration of the regularity and wisdom of this little republic, the peace and harmony that prevailed among its members, and, above all, that cheerfulness and content which was so visible in their countenances. "In the midst of these bustling beneath the Ottoman yoke, I have found," says this writer, "a rock only 3 leagues in circumference, on which the Turk dares not set his foot, and inhabited by a free and happy people. There each father of a family is a sovereign within his own house; he decides every difference, and his decrees are laws, which cannot but be equitable, since they are only dictated by paternal tenderness. When any disputes arise, the priest and the old men assemble, and decide them; but disputes cannot be frequent among citizens, who are all equal and alike unacquainted with poverty or riches. All the members of this little society are employed, and I have seen the handmaids of their women go down into the valley, to wash their linen at the fountain, as in the days of Homer. They cheer their labours with a song; and, for they imagine themselves disgraced by their humble employment. Several flocks or flocks lie near the northern coast of the island of Casso, called by the ancients the Caffian islands; they are barren, and scarce covered with a few bushes; but they shelter the road of Casso from the winds and the sea to the north.

CASPARGUS, in Ichthyology, a name given by Salvian, from Aelian, to a fish supposed to be the Sparus genus, and probably the Sparus annularis of modern naturalists: it is described as being of a plain yellowish colour, with a large annular (ocellated) spot near the tail, which perfectly agrees with Sparus annularis.

CASPASUS, or CAUASUS FLUMEN, in Ancient Geography, a river placed by Pliny in Asiatic Scythia.

CASPATYRUS, or CASAPARUS, a town of Asia, placed by Herodotus (ii. i. c. 52) in Paitya, upon the Indus; but by Hecatæus, cited by Steph. Byz. in Gandara, in the vicinity of the Sagdians and Bactrians, and south of these people. The modern name of this town, according to M. d'Anville, is Tepahre.

CASPE, in Geography, a town of Spain, in Aragon, situated at the conflux of the Guadalope and the Ebro. The adjacent country produces corn, wine, oil, and flax. Here Ferdinand IV. was elected king of Aragon; 44 miles S.E. of Saragossa, and 55 S. of Balbastro.

CASPÉAN, or BEAUTIFUL, a small lake of North America, in Greenborough, Vermont. On its western side is Hazen blockhouse. It is a head-water of La Moille river.

CASPERIA, in Ancient Geography, a town of the Sabines, mentioned by Virgil; towards the south-east of Reate. It is called Casparina by Silinius Latius, I. viii. v. 416.—Also, a country of India, on this side of the Ganges, below the sources of the Bhadaf, Rhoas, and Sandubal, according to Ptolemy.

CASPÍN, or CASPHIUS, a small but well fortified town.
of Palehine, in the tribe of Dan, seated on a small lake about 6 miles E. of Jamnia. It was fenced with high walls, and so well provided within, at the time of the Maccabæan wars, that the inhabitants, trusting to their own strength, threw out many stoutful sarscans on the Jewish army; but Judas Maccæus assaulted it with such unexpected bravery, that he made himself master of it, and put all the inhabitants to the sword, infomuch that a neighbouring lake, about 2 furlongs broad, was seen running with blood. 2 Maccab. xii. 12—16.

CASPIL PYLE OF PORTF, an important defile between the mountains and the Caspian sea. See Caspian Gates.

CASPIL SEA, in Geography, a detached sea of Asia, which has no visible connection with any of the great oceans, nor apparent outlet, and which, on this account, some writers have clasped among the larger lakes, not thinking that it properly deserves the appellation of a sea. It is bounded on the north by the province of Alfrachan and the Caucasus, and on the south, east, and west, by different provinces of Persia. The governments of Ufnik and Caucasus border on the Caspian. It was anciently called by the Greeks the Hyrcanian, i. e. the Persian Sea; by the Tartars, it is denominated Akdinglis, or the Black Sea; by the Georgians it is termed the Kuraflcan Sea; and the Persians denominate it Gurben, from the old Persian capital, Gurgan, which is said to have flood in the province of Alfrachan, only seven versts from the sea. It reaches in length about 15 degrees, from about the 37th to the 47th degree of north latitude, or about 625 miles from Gurien to Medlehitfar, and in breadth from 100 to 260 miles, where it is the widest. Its superficial contents amount to above 36,000 square English miles.

The ancient geographers were very imperfectly acquainted with this sea, and have given very unfounded and absurd deprivations of it. According to Strabo, (lib. xi. p. 773.) the Caspian is a bay, that communicates with the Great Northern Ocean, from which it issues at first by a narrow strait, and then expands into a sea, extending in breadth 500 fæd. With him Pomponius Mela (lib. iii. c. 5.) agrees, and describes the strait by which the Caspian is connected with the ocean as considerable in length, and in breadth so narrow, that it had the appearance of a river. Pliny (N. H. i. v. c. 13.) gives a similar description of it. In the age of Justinian, this opinion concerning the communication of the Caspian Sea with the ocean was still prevalent. Some early writers, by a mistake more singular, have supposeth the Caspian Sea to be connected with the Euxine. Quintus Curtius (v. c. 16.) has adopted this error. Arrian, (iv. c. 26.) though a more judicious writer, and who, by residing for some time in the province of Capadocia, as governor, might have obtained more accurate information, declares in one place, that the origin of the Caspian Sea was still unknown, and expresses a doubt whether it was connected with the Euxine, or with the Great Eastern Ocean which surrounds India. These errors appear more extraordinary, as Herodotus, near 500 years before the age of Strabo, had given a just description of this sea. "The Caspian," he says (lib. i. c. 203.) "is a sea by itself, unconnected with any other. Its length is as much as a vessel can sail with oars in 15 days, and its greatest breadth as much as it can sail in eight days." Arilottu (Meteorol. i. ii.) describes it in the same manner, and with his usual precision contends, that it ought to be called a great lake, not a sea. Diodorus Siculus (vol. ii. l. xiv. p. 261.) concurs with them in opinion. Ptolemy, however, maintained its communication with the Euxine, affirming that the waters of both had a subterraneous connection; as, otherwise, it was not to be explained how so many large rivers should flow into the Caspian; for, which there was not one channel out of it. What, it might be said, becomes of the waters of the Volga, the Yaik, the Yenba, the Kur or Cyrus, the Araxes, the Bylal, the Akia, the Kosia, the Terek, and the numberless others that flow into it? By the sun alone they cannot be evaporated; there is no visible outlet for them; and yet the sea is never perceptibly swollen, except merely in the Spring on the melting of the snows. See this subject discussed by captain Perry in his voyage of Russia, p. 102, &c. printed at London in 1716. Those who have recourse to subterraneous passages, by which its water must flow into the Persian sea, or more probably into the Euxine, allege two arguments in support of their opinion. In the first place they say, that the Caspian rises very high with a weedy wind; whereas the Euxine, on the contrary, rages mott when the wind is at eæt: consequently, the eæt wind favours the exit of the waters of the Caspian, and the wind impedes it. But this is one of those fallacies, denounced by logicians, "Causa pro non causa," all the winds that bring humid vapours with them are more stormy than those which proceed from arid regions. But the wind will come hither from the Euxine; just as from the Palus Macedon; and consequently the Caspian must necessarily be put into more vehement agitation by it. Secondly, it is pretended, that this sea has a whirlpool, which, with a horrid noise, swallows up all the superfluous water, and discharges it into the Euxine. In proof of this, it is farther urged, that a species of sea-weed, growing only on the shores of the Caspian, is found at the mouth of this tremendous vortex. To which they add, that near to this vortex is a fort of fish, which is only caught in the Euxine; and lastly, that in former days, a fish was taken in the Caspian sea, with a golden ring about its tail, on which was this inscription: "Mithridates mihi datbat in urbæ Sinope liberta em et hoc domum." See Kircher’s Mundus Subterraneus, lib. ii. c. 15. But later accounts are silent with regard to a whirlpool, the fishes said to be found only there and in the Euxine are yet to be more accurately described; and the story from Kircher has very much the air of a fiction. Sea-weed grows everywhere on the shores of this sea, from Alfrachan to Sulak, and thence again to the Mughanian Steppe. Upon the whole, therefore, we may conclude, that the escape of the waters of the Caspian into the Euxine is an ungrounded hypothesis. Seleucus Nicator, indeed, the first and most sagacious of the Syrian kings, at the time when he was still inundated with the wilder thoughts of forming a junction between the Caspian and Euxine seas by a canal, and of thus extending the trade of his subjects in Europe and supplying all the countries in the north of Asia, on the coast of the Euxine Sea, as well as many of those which stretched eallward from the Caspian, with the productions of India; but his felons failed. See Canal. None of the ancient authors above cited have determined whether the greatest length of the Caspian was from north to south, or from east to west. In the ancient maps that illustrate the geography of Ptolemy, it is delineated, as if its greatest length extended from east to west. In modern times, the first information concerning the true form of the Caspian, which the people of Europe received, was given by Antony Jenkinson, an English merchant, who with a caravan from Russia travelled along a considerable part of its coast in the year 1588. The accuracy of Jenkinson’s description was confirmed by an actual survey of that sea made by order of Peter the Great, A. D. 1718; when it was found to be in length about 1100 versts from the mouth of the Ural to the coast of the Mofanderan; its greatest width from the mouth of the Terek to the extremity of the bay of Mertvoi Kultuyk.
Kultuyk being 8°, rather more than 700 veris. At its southern extremity, from the point of Lekeron to the peninsula, situate at the mouth of the bay of Balkan, it is 8°, somewhere more than 225 veris, and at its greatest width 2° 32' or 225 veris. Its circumference, comprehending the great gulfs, but excluding the little inlets, is 4180 veris.

The Caspian is supposed at a former period to have extended further to the north, where the defects are ill fondy and fertile, and present the same fields that are found in the Caspian; but the chain of mountains which branch from the whole of the Ural to the north of Orenburg, and reaches to the Volga, muft, in all ages, have restricted the northern bounds of the Caspian. In the east this sea is generally supposed to have extended at no very remote period to the lake of Aral; the defects on that side presenting the same features as those to the north, though now an elevated level lies between the sea of Aral and the Caspian. Occasionally perhaps by the quantity of sand rolled down by the Gihon, the Sirr, and other rivers which now flow into the sea of Aral. The coasts of the Caspian northward, from the Terrek towards the west, as far as the cataract extremity of the bay of Mertvoi Kultuyk, are low, flat, swampy, and overgrown with reeds; the water too is shallow. On the other shores from the Terrek to the defect of Korgor near Alfarbad, and from the northern part of the bay of Balkan to that of Mertvoi Kultuyk, the country is mountainous, the shores bold, and the water very deep. The ground in many places, not far from the shore, is so deep that a line of 450 fathoms will not reach it. This sea is the receptacle of many large rivers, as the Emka, or Yemka, the Ural or Yak, and the Volga from the north; the Kuma, Terrek, Kur, and Kizil Ozen from the west; those from the south are inconsiderable: but from the eait it is supposed ill to receive the Tejeen; and of the rivers that were formerly supposed to disemboque into it, several do not exist, such as the Jaxartes and the Oxus (Gihon), which were pretended to flow either from the casl; the latter, in particular, is said to have flowed into it by one or two branches, till it bent northward and joined the sea of Aral. Some writers have reported, as a striking peculiarity of the Caspian, that during 30 or 35 years, its waters are constantly increasing, and then for the same term continually decrease; but this report is not confirmed by any stated observations. This sea has no regular flux or reflux; and, on account of fountains, it is navigable only by vessels drawing from 9 to 10 feet of water; it has strong currents, and, like all inland seas, is subject to violent and dangerous storms, which the Russian vessels, badly constructed, weather with difficulty. The water is in general salt, though not in all places, particularly in those where the large rivers empty themselves into it.

The Caspian has been observed to remain equally full; the true reason of which is perhaps to be sought in the quality of its bottom; which consists, not of a thick slime, but of a shell-fond, the particles of which, touching in few points, render it very porous. Of the fame substance the whole shore is likewise formed. Layer upon layer it lies three fathoms deep. This indeed lets the fresh water through, but it becomes immediately felt again by means of the salt water that prevails upon it. Through this fluid the water is filtered, and falls into the abyss beneath in the same quantity which flows into the sea. In the bay of Emka, above the river Yak, the water is seen. The water that is not let through, it therefore flagellates, and even the fishes putrefy. Its exhalations are extremely noxious. The wind that blows over this bay has been known to come on with such surprising force as to throw down the fennuda of the Russian forts, erected here, with so much violence as to kill them. In this sea there is a considerable number of islands, which are mostly sandy. The Caspian abounds with a great variety of fish. The salmon is as good as that of Riga and Archangel, and even much fishier and fat. The herings too are remarkably large, and plumper than the English and Dutch, but not so tender. To these we may add the hertel, two kinds of sturgeon, seals and porpoises. The birds most generally seen in the vicinity of this sea are hawks, herons, bitterns, fopomials, red geese, red ducks, and many others. The most beautiful of these is the red gourge, which, though so called, is white, with the tips of the wings, the orphs of the head, and feet, scarlet. It is about the size of a hok, has a long neck and high legs, is very favourab to the table, and lives on fish. It may be denominated "Cimba, vel Arica, rothro adunco lato brevi." A species of red wild ducks is also frequent, which fly in the evening to the tops of the trees or the roofs of houses, where they perform a noisy concert. Their flesh is well-tasted, not oily, though, like other water-fowl, they feed on fish. The leeches here are of two kinds, the hog-leeve and the dog-leeve. Their holes have two aptures, one towards the south and the other facing the north, which they open and shut according to the change of the wind. On the shore, between Terrek and Derbent, grows a grass on which all the quadrupeds feed with avidity to the horse alone the eating of it is fatal. They die upon the spot. Peter the Great is said to have caused an experiment to be made in his presence, and the common report was found to be true.

The parts of the Caspian may be divided into Russian, Persian, and Tartar. The Russian ports and trading places are Astrakhan, Gierief, and Kiflar. The Persian havens are Derbent, Nizzabad, Baku, Einzelker, Farabat, Melhetifar, and Alfarbad. The Tartar havens are the bay of Balkan and Manguliak. See each of these respectively.

The commerce of the Caspian is of a very ancient date; though at present it is not so considerable as it might be made. The exports amount in value to about 1,250,000, and the imports to about 1,000,000 of rubles. The articles of exportation are nearly the same with those that find purchasers on the Euxine, (which see); and in return scarcely any thing is taken but fik.

In ancient times Egypt long enjoyed a monopoly of the commerce by sea between the eait and west, and hence it derived that extraordinary degree of opulence and power for which it was conspicuous. The kings of Egypt, by their attention to maritime affairs, had formed a powerful fleet, which gave them such decided command of the sea, that they could easily have crushed any rival in this kind of trade. The Persians, however, though they carried on no commercial intercourse at sea with India, were no less deoruous than the people around them to pouff its valuable productions and elegant manufactures; and accordingly the se were conveyed to all the parts of their extensive dominions by land-carriage. The commodities, defined for the supply of the northern provinces, were transported on camels from the banks of the Indus to those of the Oxus, down the stream of which they were carried to the Caspian Sea, and distributed, partly by land-carriage, and partly by navigable rivers, through the different countries, bound on one hand by the Caspian, and on the other by the Euxine Sea. The commodities, intended for the southern and interior provinces, proceeded by land through the Caspian gates to some of the great rivers, by which they were circulated through every part of the country. This was the ancient mode of intercourse with India, while the Persian empire was govern-
ed by its native princes. In the mean while the monarchs of Egypt were allowed to continue in the un molested possession of the trade with Indry fea: but though the sovereigns both of Egypt and of Syria laboured with emulation and ardour to secure to their subjects all the advantages of the Indian trade, the power of the Romans, by a series of revolutions, proved fatal to both. Having extended their dominion over Syria, they directed their victorious arms against Egypt, which was annexed to the Roman empire and reduced into the form of a Roman province by Augustus. As early as the 14th century the Venetians and Genoese, by means of the Caspian, brought the Indian, Persian, and Arabic commodities, with which they supplied the southern parts of Europe, through Astrachan to their magazines at Azof and Caffa. From Astrachan the goods were conveyed up the Volga, then by land to the Don, and afterwards forwarded down that river to the Azof. The northern part of this continent was likewise supplied, through Astrachan, with Asiatic goods, by the Russian traders, who went to their principal magazine at Wizby, a Hafenic town in the ile of Gothland. The devellations occasioned by the wars of Timur or Tamerlane, towards the end of the 14th century, caued a transfer of this trade from Astrachan to Smyrna and Aleppo; and the Arabian commerce, more commodious for these parts, never returned to Astrachan; but part of the Persian traffic was afterwards reformed to its old channel. While the provinces of Caffan and Astrachan remained under the government of the Tartars, the camp of the khan was a mart for the Russian and Persian merchants. But as, agreeably to the customs of the Tartars, this was frequently changed, Astrachan and Turki became at length two principal places of resort. This commerce, frequently obstruited and interrupted by numerous banditti, was precarious; until the conquest of Caffan and Astrachan opened a ready communication between Moscow and the Caspian Sea; Ivan Vasilievitch II. having garrisoned Astrachan with troops, rendered it the chief emporium of the eastern trade. See Astrakan. This conquest being completed in 1554, soon after the discovery of Archangel, the English obtained the czar’s permission to pass through his dominions into Persia, and to carry on an exclusive trade over the Caspian. In 1558, Jenkinson, the first Englishman who navigated that sea, landed at Mangnifiluk upon the easterne shore, passed by land through the country of the Turkoman Tartars to Bokhara, capital of Great Bucharia, and returned to Moscow in the following year. In 1591 he again failed over the Caspian, and, proceeding to the coast of Shirvan, went by land to Caffin, and obtained from the Soffy permission to trade into Persia. Several merchants followed his example. In 1597, Christopher Barrowks conducted an expedition, which was attended with many dangers, and at length arrived at Astrachan. During these expeditions, the traffic was chiefly confined to the ports of Tauron, Derbent, Baku, and the coast of Ghilan. This infant commerce was much impeded by the banditti that frequented the shores of the Caspian, and by the wars between the Turks and Persians; and therefore during above a century and a half no Englishveil appeared upon this sea. At length, in 1741, the British merchants of St. Peterburgh, at the persuasion of captain Elton, an Englishman in the Russian service, renewed the commerce, and established a factory at Khild in the province of Ghilan. In consequence of some disputes with the Russians, he entered into the service of Nadir Shah, and asisted in constructing some veiils on the Caspian. This circumstance gave umbrage to the court of St. Peterburg; and Elizabeth, in 1746, withdrew her permission to the English merchants of passing through her dominions for the Caspian commerce. On the death of Nadir Shah, who, by Elton’s influence, had permitted the English to trade to Persia, their factory was pitched by one of the pretenders to the throne, and their commerce annihilated.

The Russins pursued, with perseverance, the track opened by our merchants, and under Alexy Michaelovitch, Astrachan became the centre of the Persian trade; to which place merchants from Bucharia, Cem Tartary, Armenia, Persia, and even India, resorted. By the rebellion of the Collacks of the Don, under Stenko Razin, and the devastations occasioned by it, the trade of Russia was annihilated. When this revolt was quelled, the greater part of the commerce fell into the hands of the Armenian merchants established in Astrachan, who settled factories in both the Russian and Persian territories. During this whole period the Russian and Armenian traders penetrated no further than Nizabab, a port between Derbent and Baku; and their chief settlement was at Samske, capital of Shirvan, until the year 1712, when that town was taken by the Ledges, and the factory destroyed. In 1721, this commerce was renewed by Peter I. who obtained the cession of the provinces of Dagefsan, Shirvan, Ghilan, and Masanderan, on the eastern and southern coasts of the Caspian. Soon afterwards he established a Russian merchantable company trading to the Caspian; the whole capital of which consisted only of 400 achins or flowers, of the value of 135 rubles or 5d. each. The chief settlements were formed at Astrachan and Kifhar. At the possession of these distant provinces was very expensive. Anne reformed them to the Soffy, on condition that the Russian merchants should enjoy liberty of trade to all the havens of the Caspian without paying duty, be allowed to build houses and magazines, and be subject to the laws of the country. The privileges of this company were confirmed by Anne and Elizabeth; but in 1762, Catharine II. abolished the exclusive right of this company, and permitted all her subjects to trade with Persia; prohibiting, on account of the numerous banditti that infelt the roads, the inland traffic from Kifhar, and the other Caspian ports to Shamasee. Two Russian castles reside at Baku and Elizaulee. The Armenian merchants, however, carry on a contraband trade, and from their knowledge of the country and language, under-riiff the Russins. See Astrakan. In the year 1760, the exports and imports of the whole commerce, both by sea and land, to and from the Caspian Sea, amounted only to about 400,000 rubles; in 1768, to upwards of 350,000; and in 1775, to more than a million of rubles; without reckoning the contraband trade. At present it may be estimated at the same amount.

The fishery on the Caspian is the most important branch of this business in Russia. This is owing in a great measure to the excellent kinds of fish with which it abounds, to its commodious situation in the centre of the empire, facilitated by water communications, and the advantageous method in which this trade is prosecuted. Pallas observs, that the fishery on the Caspian is in some respects as important to Russia as the herring, the cod, and the whale fishery are to other maritime powers of Europe. The fishery on the northern or Russian shores of the Caspian is partly let out to merchants of Astrachan, whose great opulence is founded on it; and it partly belongs, in virtue of ancient privileges, to the Urallian Kozsks or Collacks. See Astrakan and Urals.

As the Caspian is usually free from ice towards the latter end of March, the fishery commences about the middle of March or beginning of April; and it is carried on by several contractors,
contradictions, each of whom has his particular station or "vataga," commonly bearing the name of the proprietor. Every vataga is occupied by from 50 to 80 to 120 men, most of whom carry on a separate trade; and here are also pilots, fishermen, farters, preparers of ingsluts and cavear, &c. The vatagas have also their own vessels of various dimensions and constructions; and near the habitations of the people that are employed are several fhefs, where the races are prepared, the ingluts dried, and the block of fish kept in order. For preserving the salted fish, deep and well-secured ice-cellarfs of considerable magnitude are dug under ground, and they are furnished with large reaefs, in which the fresh fish are picked in a strong hine. There are various other conveniences adapted to the necessary operations. The taxes paid by the vatagas to the crown are rated according to the quantity of prepared races and ingluts; and for every pound of ingsluts free rubles, but for a pound of races two rubles 8o Kopeeks are paid into the caife. In autumn and winter only the beluga is caught, which then collect into the bays, either for palling the winter or to spawn. About the middle of March, when the sea begins to be free from ice, myriads of little fish drive towards the shore, and of these the "olila," a fort of scale-fish, is caught and kept alive in wells, in order to furnish a suply for baiting the hooks while the season lasts. This fry is followed by prodigious swarms of ravenous belugas; and whilst this swarming lasts, a vein may bring up within 24 hours 50 of them and more. The beluga is caught by means of a machine consisting of a rope 70 ells in length, to which 150 lines of the length of 1 fathom each, with as many large angling-hooks, are tied. This rope with its hooks is technically termed a neal, and 50 of these neals tied together commonly belong to a machine, which is therefore several hundred fathomfs in length. Between every two neals a done is tied of some pounds in weight, and the two ends of a whole machine are furnished with wooden anchors. The machine, when laid, is visited twice a day, and the hooks cautiously taken up along the rope. Pulling a rope through the gills of the fish brought up, they let them down again into the water in order to bring them on flore alive. Here they are dragged with hooks to the beach, which is laid with planks, and cut up in the following order: the lower part of the flomach, with the guls, is thrown away; the fishy gellet is salted for eating; the roe lies through the whole body adjoining to the entrails; this is taken out with the hand and cut into tubes, in which it is carried away by the canever-makers; then follows the float or founds, which runs along the whole back, and is given to the ingsluts-makers. Lastly, they cut off the cartilage of the back, in order to extract the doral fins, which are washed, hung upon poles, and dried in the air. The fish, being cleared of its entrails, the fat adhering about the meat and to the fins is scraped away with knives, collected into tubes, boiled down, and cleansed. This fresh fat, being of a good taste, is used during the fools instead of butter or oil. The cleansed fish are at last brought into the cellar above described, pickled in brine, and then frozen with salt, and laid up in courses on each other. When the freezing of the beluga has ceased, the train of the ingsluts comes on, which happens only once a year and lasts not much above two weeks. At one vataga, it is usual, with a favourable sea-breeze, to catch 16 and sometimes 20 thousand of these fish. The nets made use of for this purpose are so thick that the machines are only a span wide. Twenty-five of them are tied together and laid at the depth of one fathom on sunk pofts, as the fervugas go to shallow places. The largest of these fish are never above 4½ ariehus (each arieh 28 English inches); but their roes, as well as their founds, are much more esteemed than those of the beluga, and consequently bear a greater price. The fish is partly salted down, and partly dried in the sun. In May, when the spring-capture on the sea-coast is over, the fishermen repair with their goods to Astrachan, where they are laid up in the store-cellarfs, and thence disposed of wholly to the merchants of that city. The autumn-capture begins in the middle of September, and continues through the whole of October. The winter-capture begins as soon as the ice is set on in the sea, and lasts the whole winter. For taking the beluga in this season, the machine with the angling-hooks already described is set under the ice; through which apertures are cut at the distance of eight paces asunder, and through these the rope is introduced, by means of long poles. When two neals are tied together, the machine is fastened to a crosspole, which rests on the brink of the aperture. The fish, when taken, are conveyed over the ice on sledges to the vataga, and thence carried to Astrachan. Besides the great vatagas, the proprietors of them have fishing-huts in different places on the sea-coast, where there is no capture of lucrative, at which, mostly in summer, fish and barbels are taken with drag-nets. The lands here usually weigh eight pounds (of 20 pounds each), and the barrel a pound and a half; the former are extremely fat in summer. The roes of this fish are thrown away, but of its founds an ordinary fort of fish glue is made. For an account of other fisheries in the rivers that run into the Caspian Sea, see VOLGA and URAL. See also ASTRACHAN. The seal-capture, which is carried on by the more opulent part of the Astrachan merchants on the Caspian, is likewise very profitable. The seals are killed in spring and autumn on the islands, where they are immediately gutted and powdered with salt, and then brought to Astrachan, where they are salted, and the tallow of them is melted. The Astrakhanfs by salting their feals immediately on the spot gain this advantage, that the tallow is much cleaner and better than that of the seals taken at Archangel. The fishermen affirm, that the Caspian is incomparably richer in feals than any other sea on the Russian coasts. Robertson's India. Coke's Travels in Russia, vol. iii. Tooke's View of the Russian Empire, vol. i. and iii.

CASPRAIN Gates, Cafsfic Pyle, or Cafsfic Ports, in Ancient Geography, denote passes that lie between the mountains of Caucasus and the Caspian Sea. The name of Caspian or Alazanian gates is properly applied to Derbend, which occupies a short defile between the mountains and the sea: the city, if we give credit to local tradition, had been founded by the Greeks; and this dangerous entrance was fortified by the kings of Persia with a mole, double walls, and doors of iron. The Iberian gates, sometimes called by geographers with the Caspian, are formed by a narrow passage of six miles in mount Caucasus, which opens from the northern side of Iberia or Georgia, into the plain that reaches to the Tanais and the Volga. A fortress, designed by Alexander, perhaps, or one of his successors, commanded that important post. Procopius, with some confusion, always denominates them Caspian. This pass is now styled "Tatar-topa," the Tatar-gates.

CASPIS, a people who inhabited the environs of the Caspian Sea, called "Caspia regio," to the west and the east of the river Cambyses, between the Sopyrri and the Caspian Sea. They occupied also the country towards the north of this sea; and to the east of the Tigris, between Parthia and Media.
CASPIRA, now Cashmere, a town of India on this side of the Ganges, near mount Emnodus, and towards the north of the source of the Hydaspes. See Cashmer.

CASPIRAS, a people of India on this side the Ganges, to whom Ptolemy has assigned 16 cities, of which Cragaun was the capital.

CASPIRIA, a name given by Ptolemy to the Fortunate Islands, situate in the Atlantic ocean.

CASPIRUS, a town of Asia on the frontiers of India, in the country of the Parthians, according to Herodotus, (cited by Steph. Byz.), who calls it Caspius.

CASPIUS, the Caspian mountain, a name given by Ptolemy to a mountain which bounded the Greater Armenia. The ancients gave this name to two mountains; one, just mentioned, bounding Armenia; the other in Parthia.

CASQUE, in Conchology, a term among the French, synonymous with the Latin Cassilia, a genus of the univalve shells established in the new System of Bruguière for the reception of a particular family of the Linnean Buccinum. See Buccinum in article Conchology.

CASQUE, in Military Language, a small beginning. See Cask.

CASK, a town of Persia, in the province of Meccan; 185 miles W. of Meccan.

CASKONI, a canton of Golof, the department of the island of Corsica, according to the French arrangement, including 1,112 inhabitants.

CASSADA, or CASSAYA, in Botany. See Iatropha Manihot.

CASSAGATH, in Geography, a lake of North America; N. lat. 62° 33'; W. long. 166° 15'.

CASSAGNAS, a town of France in the department of the Lozere, and district of Florac; eight miles S.E. of Florac.


CASSAGNES, BEGONZ, a town of France, in the department of Aveyron, and chief place of a canton in the district of Rodes or Rhodes; 10 miles S. of Rhodes. The place contains 1,432, and the canton 7,208 inhabitants; the territory comprehends 217,470 kilometres and 223 communes.

CASSALAGAS, a town of Spain, in Old Castile; four leagues from Talavera.

CASSAMUNAIR, or CASSUMUNAIR, in the Materia Medica, an aromatic vegetable drug, brought from the East Indies, highly valued as a nerve and tonic, and reputed a specific in epileptic and convulsive diseases. It is supposed by some to be a species of galangal, and by others of zedoary: its true name is not known, that of Caffamunair being apparently feigned to hide it; of late it has been imported by the name of benzoin.

CASSANA, NICOLÒ, called NICOLINO, in Biography, a painter of history and portrait, distinguished by the beauty of his colouring, and the gracefulness of his figures, was born at Venice in 1659, and received instructions from his father Giovanni Francesco Cassana, a Genoese, who had been taught the art of painting by Bernardino Strozzi. At the court of the grand duke of Tuscany, whither he was invited, he distinguished himself by the portraits of that prince and his confidants; and during his residence at Florence, he painted several historical subjects, of which the most considerable feoms to have been the conspiracy of Catilina, consisting of nine figures as large as life, drawn to the knees; the two principal figures being represented as with one hand joined in the presence of their companions, and holding in the other a cup of blood. Nicolo was also invited to England with flattering promises of encouragement; and on his arrival was introduced to queen Anne, whose portrait he painted, and who distinguished him by many tokens of favour: but his good fortune was of no long duration, as he died in London in 1713, universally regretted. Pilkington.

CASSANO, GIOVANNI ANTONINO, called L'Abate Caffana, the younger brother of the preceding, was born in 1661, and after receiving the rudiments of his education from his father, finished his studies at Venice, where his brother Nicolò resided for some time. Although he was a good portrait or historical painter, he declined interfering with his brother in these departments of his art, and restricted himself to the representation of animals and various fruits, in which he excelled. His pictures of these classes are frequent in the collections of Italy, and sometimes ascribed to Castiglione. He closed his life at Genoa, after having indulged a liberality and profusion, which his circumstances did not warrant, in neglect, indigence and wretchedness. He had a sister, Maria Vittoria Caffana, who painted images of devotion for private amateurs, and died at Venice in the beginning of the 17th century. Pilkington.

CASSANDER, a king of Macedon, was son of Antipater, and one of Alexander's chief captains. Upon the death of Alexander, and the subsequent division of his empire, the province of Caria was assigned to Cassander, and he was also appointed by his father general of the horse. When Antipater died, in the year B.C. 319, he bequeathed his high offices of protector and governor of Macedon to Polyperchon; by which preference the remission of the ambitious Cassander was routed, so that he soon began to form a party for the subversion of the new protector's power. Accordingly he withdrew to the court of Antigonus, and having obtained some succours from him, failed for Athens, and secured it. He afterwards marched to Macedon, for the purpose of opposing the tyranny of Olympias, widow of Philip, and mother of Alexander; and having besieged her in Pydna, he took possession of the place, and ordered her to be put to death. After her death, he sent Roxana and her son Alexander to Amphipolis, where they were made Prisoners; and thus set aside the line of Alexander, in Macedonia, his own country. Cassander having provided for his own safety, affirmed the government: built a new city in Pallene, which he called Cafsandria, repaired many others, and by various measures manifested his inclination to restore peace and plenty to his native country. Having established tranquillity in Macedon, he returned into Greece in order to drive from thence Polyperchon, his son Alexander, who was protected by Antigonus, and his other enemies. In the mean while he rebuilt Beotian Thebes, which had lain in ruins about 20 years, and caused it to be re-inhabited. After various military contests, the captains of Alexander became weary of the wars in which they had engaged with each other, and therefore unanimously desiring peace, it was easily concluded on the following conditions; viz. that each of them should retain possession of the provinces which they belonged to them; that the Greek cities should be free, and that they should be friends, and allies of each other. Cassander, in order the more effectually to secure himself in the possession of Macedon, put to death Roxana and her son Alexander, whom he had kept in a state of confinement;
CASSANDRA, in Entomology, one of the Fabirician species of Phalarna, (Bombyx), decribed from the Hunterian museum. The wings are ferruginous, with darker streaks; anterior part of the thorax chestnut.

Obf. Cramer describes a variety of the Fabrician bombyx erythrina as a distinct species under the name of cefandria.

CASSANDRA, Gulf of, in Geography, a bay on the coast of Europe, in the north-west part of the Archipelago, east of the gulf of Salomiki. It is so called on account of a small island of the same name that lies at its extremity; and it was formerly called "Toronacius Sinus." N. lat. 42°. E. long. 23° 44'.

CASSANDRA Nyma, a town of European Turkey, in the province of Macedonia, situated on the north coast of the entrance into the gulf of Salomiki; 15 miles E. of Salomiki.

CASSANDRA, in Fabulous History, daughter of Pram, king of Troy, and Hecuba, who is said to have received the gift of prophecy from Apollo, on condition of gratifying his passion. Having obtained the gift, she violated her engagement; and Apollo, being thus deceived, instead of revoking the gift, cau{ed her to be considered as mad, and her predictions to be disregarded. Many of the predictions, which she delivered, during the impending calamities of Troy, were afterwards verified in the event. During the sack of that city, she fled for safety into the temple of Minerva, where she was barbarously violated by Ajax, the son of Oileus. See Ajax Oileades. In the distribution of the plunder of Troy, Cassandra fell to the lot of Agamemnon, who took her home, where she excited the jealousy of Clytemnestra; so that she fell a victim, on occasion of the affiliation of that prince. Cassandra was singularly beautiful, and had many suitors of distinguished rank in the flourishing time of Troy. She had a temple at Leucra, in which a statue was erected to her honour, under the name of Alexandra, by which appellation she was as well known as by that of Cassandra. This appears from Lycephon's poem, still extant, entitled Alexandra, because it is a prophecy made, as the poet supposes, by Cassandra. This poet also speaks of a temple of Cassandra built by the Damnians, and by the inhabitants of the city of Dardanus; where her statue was re-erected to an asylum by young women who rejected their suitors on account of their uncles' death or men's extraction. Plutarch says, that there was in Thalamus, a city of Peloponnesus, an oracle of Paphos; and that, as some writers reported, Cassandria died in that place, and was called Paphos, because she delivered oracles to all who consulted her. See DICTUS.

CASSANDRIA, in Ancient Geography, a maritime town of Macedonia, more anciently called Paphos, and rebuilt by Cassandra, whom it derived its name. See CASSANDRA.

CASSANDRA, in Geography, a town of Dutch Flanders, in the island of Cassandria; one league N. of Sluys.

CASSANITAE, in Ancient Geography, a people of Arabia Felix, on the banks of the Red Sea.
CASSANO, in Geography, a town of Naples, in the province of Principe Ulta; 12 miles W. of Conza.—Albo, a town of Naples, in the country of Bari; 15 miles S. of Bari.—Albo, a town of Naples, in the province of Calabria Cuts, the ice of a fountain, infarrant of Cosenza; 21 miles N.W. of Rosello. N. lat. 30° 55'. E. long. 16° 30'.—Albo, a town of the duchy of Milan, seated on the Adda; 16 miles N.E. of Milan. N. lat. 45° 20'. E. long. 10°.

CASSARANO, a town of Naples, in the province of Otranto; 8 miles W.N.W. of Alessano.

CASSAREEN, the ancient Colonia Scalitana, memorable for the martyrdom of its citizens, a town of Africa, in the inland country of the ancient Bizantium, and present kingdom of Tunis, seated on an eminence, 6 leagues W.S.W. of Spalita. The river Derb runs winding below it; and upon a precipice that hangs over this river is a triumphal arch, with an attic structure above it, with some rude Corinthian-like ornaments upon the entablature, though the pilasters are Gothic. In the plains below Cassareen are several Mausolea, from which the town is laid to derive its name; these appearing at a distance like to many Cassareen, i.e. towers or forts.

CASSATION, derived from the Latin quasit, to quaff, or shock down, in the Civil Law, the act of abrogating, or annulling any act or proceeding. In the occurrences of cassation are, 1st, when a decree is directly contrary to another decree; and both against the same party. 2dly, When decrees are directly contrary to the express decision of flates or customs. 3dly, When the formalities prescribed by the laws have not been observed.

CASSE, in Military Language, a breaking or caatinger, is a disgraceful or an ignominious deprivation of, or dismission from, any military office, rank, situation, or employment.

This punishment has been and may be extended to an entire corps, to a company, to an officer, to a non-commissioned officer, or to a soldier of a chosen or select company.

To break or caftinger a body of troops, as a regiment or a company, for example, is to degrade and depose or dismiss it after having adjudged it guilty of an offence that renders it unworthy of serving its country.

To break or caftinger an officer, is to deprive him of, or dismiss him from, his employment, because his conduct and behaviour have been unworthy of, or unbecoming the rank he holds, or because he has been guilty of some great offense against military discipline.

To break or caftinger a non-commissioned officer is, to withdraw from him the authority he was entrusted with, to deprive him of the employment he filled, and to reduce him to the condition of a common soldier.

And to break or caftinger a soldier or member of a chosen, particular, or select company, as a grenadier, for instance, is to send him back to the company from which he was taken or selected, after showing him to be undervaluing or unworthy of the distinguished situation he was placed in.

The practice of breaking or caftinger whole regiments or companies ignominiously, for misconduct or misbehaviour, is now, however, and perhaps, with reason, altogether laid aside. For, to let a regiment or company behave ever so ill, it rarely, or rather never happens, that every individual in it is in fault. Some other military punishment should, therefore, be adopted, that has a tendency to make those in a company or other body of troops, who are naturally disposed to behave well, feel interested in the good behaviour of the rest, and act as a check on them. The Romans had a practice which was admirably calculated to produce this effect. When a maniple, cohort, or other body of their troops beha

...
CASSERIUS, Julius, in Biography, a distinguished anatomist of humble parentage, but of great talents, was born at Placentia in 1545. His genius leading him to the study of anatomy, he went to Padua, and became a servant to Fabricius, who, discovering his propriety, made him his pupil, and, in succession, his assistant, and, at length, coadjutor in the professorship of anatomy. To this honour he was preferred in the year 1609, and he continued to fill the office with credit until the year 1616, when he died. As his diligence and industry equalled his genius, he became, in a few years, more knowing and skilful in his profession than his preceptor. Fabricius, in the opinion of Dougla, excelled in philosophy, Cafferius in anatomy. This excited, however, no jealousy. Fabricius, who was far advanced in years, was well pleased with the prospect of leaving a successor, so well qualified to advance the knowledge of the art; but in this he was disappointed, as he surmised his pupil by more than three years. He was succeeded by Spigelius, who had been their common pupil. Of Cafferius's anxious desire to leave behind him a name, we have numerous proofs. Almost the whole of the revenue he obtained by teaching anatomy was expended in procuring subjects for dissection, and in paying draughtsmen and engravers to delineate figures of such parts of the body as he either discovered, or thought he had Fuller conceptions of than his predecessor. In the presence of his anatomical works he is not backward in affirming that he has furnished future anatomists with delineations of the parts of human and animal bodies, exceeding in elegance, perspicuity, and correctness, all that had preceded them. It will be observed he made use of animals, not as successes, but only to enable him to discover minute parts which were not readily distinguishable in the human body. In giving this account, principally from Dougla's Specimen and the Diet. Hist. of Med. Elyot, we cannot help observing in how many points, in genius, in industry, and zeal for the advancement of the art, a late celebrated anatomist, Mr. John Hunter, resembled the character we are here depicting. The title of his first work, published in 1652, is, "De Voscis Audituque Organis Huius Anatomica, &c. Trajecti duobus explicata," Ferrara, fol. Figure partim tam in honore quam in multis aliis animantibus, tabulis 53 comprehendunt."

He here lays claim to the discovery of a muscle, moving the maleus, one of the osseous auditis. He also improved. Haller says, the anatomy of the larynx.

"Punctuallipherfeion, id est, de quinque Sensibus Liber, Organum Fabricam, Actionem et Usum continens, Venet. 1659, fol. Iconibus fidicier oxe incis illustratum." This is an extension of the former work to the retic of the fences, executed with equal skill. They have both been several times reprinted. It was not until some years after the death of Spigelius, which happened in 1652, that the remainder of Cafferius's works, consisting of 78 anatomical plates, with the explanations, was published. Bucretius, to whom Spigelius had left the care of his productions, incorporated the works of Cafferius with them, and published them together in royal folio, in 1627, at Venice. Two of the plates by Cafferius, viz. one representing the phalanges, and another the tympani, are printed with Spigelius's work, "De Formato Fumico," fol. 1627. Dougla, Bib. Anat. Spec. Histor. Bibl. Anat. Elyot, Diet. Hist.

CASSETTES, or Coffins, in the Manufactory of China Ware, are utensils made of Stourbridge or other good potter's clay with a third of sand, in which the China ware is baked. They are generally made of a round form, with a flat bottom. They are either turned or formed in a mould. See Porcelain.

CASSI-a-oficer, a name given to the grand provost of the Turkish armies.

CASSIA, in Botany, (κασσά, Diosic.; κασσια, Theophrast.) in its original acceptation, is the name of an oriental shrub, the bark of which has been held in high estimation, from the earliest antiquity, on account of its aromatic qualities, which resemble those of cinnamon. The grammarians who for the most part think it better to invent a bad etymology than go entirely without one, tell us, that it is called ταται to κασσια, ab orando, quasi κασσαίοις, κασσαίοις, κασσαίοις, κασσαίοις, quod huic fragrantissimae venustatis. But the word is indifferently of Asiatic origin, and was brought into Greece, along with the commercial article which it denoted, by the Phoenician merchants. It is no other than the τάται, kethel, of the Hebrews and other orientals. In the books of the Old Testament it occurs, indeed, only once, and that in the plural number. "Thou lovest righteousness and hatest wickedness: therefore God, thy God, hath anointed thee with the oil of gladness above thy fellows. All thy garments shall smell of myrrh and aloes, and cassia." Ps. lxi. 5, 8. This psalm, we apprehend, may be referred without hesitation to the reign of Solomon. The plural termination was probably
CASSIA.

bably adopted by the Hebrews, on account of the small detached pieces into which the bark was usually divided when it came into the hands of the merchants; but the seventy in conformity with the general usage of Greek writers, give it in the singular number and with a fuggle σ, which appears to be the original orthography. But though the Phoenicians communicated the name to the Greeks, they did not themselves adopt that by which this precious commodity was known in its native climate. In the Hebrew language, of which the Syro-Phoenician is only a different dialect, the verb יָּשַׁר signifies to strip any thing of its covering; and thence was naturally applied to a figurative term to denote the bark of a tree separated from the trunk; and the high value which was set on the aromatic bark brought from the remotest regions of the then known earth, might as naturally cause it to be called bark by way of eminence; in the same manner as another kind of bark is thus distinguished in modern times. The word caffia occurs in two other passages of our common translation of the Old Testament: Exod. xxx. 24. Ezek. xxvii. 19.; but in thebe the original כָּשַׁה, which the Septuagint in Exodus renders φυκόν, in Ezekiel appear not to have had in their copies. It was probably somewhat different from Caffia; but from its connection in the book of Exodus with myrrh, cinnamon, and sweet calamus, appears to have come from the same family, and to have poleilized similar properties.

This oriental aromatic is the caffia of modern cookery, but not of modern botany. We must, therefore, refer for its character and history to the article laurus, under which genus it is now placed.

The naturalist has often reason to lament that travellers and merchants have given the name of one thing long known to another recently discovered, on account of a real or fancied resemblance in a figure particular, although in every other respect it is entirely different. Such has been the fate of Caffia. The Romans used the word with considerable latitude. When Virgil, extolling the simple fare of the happy husbandman, says,

"Nee caffia liquidi corrositum usus olivi,"

he cannot be supposed to speak of the caffia which he mentions in his second eclogue, as interwoven with the flowers of the violet, poppy, narcissus, and sweet-smelling anise in the garland made for Alexis by the naiad. In the former passage he undoubtedly alludes to the aromatic bark which the luxurious citizens of Rome infused in their table and culinary oil to give it a grateful smell and flavour. In the latter he must have intended some odoriferous herb, or shrub, which is a native of Italy; but by what name it is now known cannot easily be determined.

In the middle ages, the Arabian and Greek physicians, as appears from the writings of Avicenna and Myrephus, acknowledged two kinds of caffia; one, caffia aromatic, a native of India, the caffia of the ancients; the other, caffia foliata, a native of Egypt, totally different in its general appearance, botanical characters, and medical qualities; and which appears to have been honoured with the same name as that which from time immemorial had distinguished the precious oriental spice, merely on account of its pleasant smell; for we are informed by Alpinus, that when he was in Egypt in the latter part of the sixteenth century, the natives took great delight in walking early in the morning in the spring leaen near plantations of this kind of caffia, and regaling themselves with the fragrance of its flowers. To this species, and its numerous congener, the term caffia, as a generic appellation, is confined by modern botanists.

cce, Linn. Leguminosae, Juss.

Gen. Ch. Cal. Perianth five-leafed, (five-cleft, Gart. Juss.) lax, concave, coloured, deciduous. Cor. Petals five, roundish, concave; lower ones more dilant, more spreading, larger. Stam. Filaments ten, declined; the three inferior ones longer; three inferior anthers very large, arcuate, beaked, opening at the tip; three lateral ones without a beak; three upper ones very small, barren. Pjfl. Germ somewhat cylindrical, long, pedicelluted; style very short; stigma exerted, ascending. Peric. Legume oblong, with transverse partitions. Seeds several, roundish, affixed to the upper future.

Eff. Ch. Calyx five-leafed. Petals five; three upper anthers barren; three lower ones beaked. Fruit a legume. Obi. Tournefort divided the genus into two; caffia with oblong legumes, entire partitions, and generally pulpy cells; and fenna, with gibbous, infected partitions, and very thin partitions. Gartner has adopted his two genera with the following essential characters.


Caffia. Flower as in fenna. Legume long, cylindrical, woody, not opening by valves, many-celled; cells filled with pulp. Seeds albuminous; albumen with a chink on each side. Embrio straight.

Sp. 1. C. diphylla, Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. (Niella-wari Indorum, Burm. Pl. Ind. 94.) "Leaves conjugate; stipules cordate-lanceolate." A shrub. Stem cylindrical. Leaves on a short petiole; leaflets two, semi-ovariable, oblong, dilated. Stipulae covering the branches. A native of the East Indies. La Marck observes that it must have been marked as an annual in the Species Plantarum by mauleuse; for no shrub can be an annual. 2. C. Abus, Linn. Sp. Pl. 2. Mart. 3. Lam. 2. Willd. 2. (Senna quadrifolia, Burm. Zeyl. 212. tab. 97. Senna exiguus, &c. Pluk. alm. 341. tab. 62. fig. 1. Loto affinis Aegyptica, Bauh. pin. 532. Abusus, Alp. Aeg. 97.) "Leaflets in two pairs, inerely egg-shaped; with two awl-shaped glands between the leaflets." Root annual. Stem herbaceous, scarcely a foot high, weak, villous, branched. Leaves alternate. Flowers reddish, marked with purple veins, axillary, two or three together; peduncles shorter than the leaves. Legumes about an inch long, compressed, hispid. Seeds from four to six, blackish, shining. 3. C. omissa, Linn. Sp. pl. 2. Mart. 4. Lam. 3. Willd. 3. Brown. Jam. 233. Suse Jam. 2. 49. tab. 189. fig. 6, 7. Swartz obf. 156. "Leaflets in two pairs, ovate-oblong, acuminate; with an oblong gland between the leaflets; and an obsolete, three-toothed spine, or callous scale under each petiole." A shrub. Stem forty or fifty foot high, inflated, stiff; branches diver- cated, loose, stiffly, round, inflated, smooth, fimbriate when old. Leaflets petioled, entire, nervet, veined, very smooth; lower pair bent down, spreading; upper pair bent down perpendicularly, approximating; general petals thickened at the base, round, usually directed one way. Flowers numerous, large, in axillary racemes, on long peduncles; calyx leaves egg-shaped, reflexed, spreading, small, pale green; four upper petals smaller, egg-shaped, with claws; the fifth largish, concave; germ linear, longer than the corolla, curved back. Legume short, compressed. Swartz. A native of Jamaica in the woods of the higher mountains, in the anterior of the island. 4. C. batillaris, Linn. jun. Supp. p. 231. Mart. 2. Lam. 4. Willd. 4. (C. fruticosa, Mill. dict. 10. Mart. 39. C. americana tetraphylla, Houft. Reilq,
Cassia

Reliq. tab. 17) "Leaflets egg-shaped, oblique in two pairs, with an obtuse gland between the small; racemes axillary, penduncled; legumes cylindrical, long." A shrub, twelve feet high, very much branched. Leaflets alternate, trifoliate; leaflets smooth on both sides; lower ones exactly egg-shaped; upper ones more elongated. Stipules minute. Flowers yellow, of a middling size; racemes solitary, few-flowered, erect; pedicel dependent, angular. Leaves so like that of C. fistula as not to be distinguished from it. A native of Surinam and Vera Cruz. Miller attributes terminal racemes to his C. fistula, but as La Marck refers Linnent's figure to basilicaris, and as Miller's description agrees sufficiently with that of the younger Linneas, we have ventured to consider them as one and the same species. C. arborea, (C. arboreus, Mill. 40. Mill. dict. 15. Hooff. MS.) "Leaflets in two pairs, oblong-egg-shaped, vilous underneath; flowers in corymbs; stem erect, arborescent. Sometimes twenty-five or thirty feet high, much branched. Leaflets on long petioles; leaflets four inches long, near two broad. Flowers deep yellow, inclining to orange, lateral and terminal; lateral ones few, scattered; terminal in large round branches, proceeding from one centre. Legumes near nine inches long, compressed, with a border on each side. Seeds oval, smooth, compressed. A native of Vera Cruz. 6. C. tetraphylla, Linn. 24. (C. procumbens, Mill. dict. 20. Hooff. MS.) "Leaflets in two pairs, egg-shaped; flowers yellow, axillary; legumes bifluate; stems procumbent." Root annual. Stem about two feet long, herbaeous. Leaflets on long petioles, at a considerable distance from each other. Flowers pale yellow. Leaves short, flat. Stems flat. A native of Vera Cruz. 7. C. tagetes, Linn. Sp. Pl. 5. Lam. 6. Wildfl. 5. (V. Tagetes, Rheed. Mal. 2. p. 103. tab. 52. Ral. hist. p. 1743. Caffia 6. Senna spuria, &c. Ann. herb. 633. 53.) "Leaflets in three (two) pairs; gland petiolar; stipules ciliate, heart shaped, acuminate." Linn. "Leaflets in two pairs, inerexy egg-shaped; peduncles one-flowered, very short; legumes narrow, linear." Lam. A shrub. Stem procumbent; branches silky. Leaflets, four, semi orbicular, veined, the two outer ones larger; petioles very short. Linn. Stem three or four feet high, hard, cylindrical, greenish. Leaves alternate; leaflets thickish, flat, with parallel nerves, the two upper ones largel. Flowers yellow, axillary. A native of Malabar. La Marck questions whether his plant be the tagetes of Linneas, and observes that it is distinguished from the next species by the number of its leaflets. We are persuaded that tripus is in Linneas's specific character is merely an error of the press. 8. C. tora, Linn. Sp. Pl. 5. Mart. 6. Lam. 7. Wildfl. 6. (Senna orientalis, tala Zeylanicum Henn. Lugd. 557. Ral. hist. 1743. Galaga indica, Ral. hist. 911. Gallinaria rotundifolia, Rumpl. Amb. 5. p. 283; tab. 97. fig. 2. Caffia filiga from Grezzi, Plum. spec. 18. tab. 76. fig. 2. Caffia filiga quaeratur, Dill. Elth. 72. tab. 73. fig. 73.) "Leaflets in three pairs, inerexy egg-shaped; outer ones larger; an awl-shaped gland between the four lower ones." Linn. "Leaflets in three pairs, inerexy egg-shaped; peduncles short, generally one-flowered; legumes linear, long, very narrow." Lam. Root annual. Stem from one to two feet high, herbaceous, upright, cylindrical, sometimes simple, more frequently branched, smooth. Leaves alternate; leaflets smooth, somewhat glaucous, with a pointed gland between each of the lower ones; stipules linear, bristle-shaped, a little villous. Flowers yellow, axillary. Legumes from four to six inches long, with a small border on each side, more or less curved, smooth. A native of the East Indies. 9. C. limoniflora, Lam. 8. Miller dict. tab. 82. "Leaflets in three or four pairs, inerexy egg-shaped, very obtuse; smooth; racemes penduncled, elongated, axillary." Nearly allied to the preceding, but easily distinguished from it by the inflorescence. Root annual. Stem a foot and a half high, smooth, clustered to the summit, somewhat branched. Leaves becoming larger as they proceed from the root; lower ones with only one pair of leaflets, those above with two, those still higher with three, and those near the summit sometimes four; stipules awl-shaped. Flowers yellow; from seven to ten together in penduncled axillary racemes. Found by Dombey about Lima. 10. C. bicapsularis, Linn. Sp. Pl. 6. Mart. 57. Lam. 9. Wildfl. 7. (C. hexapetalus; filica bicapsulati, Plum. spec. 18. Barm. Amer. tab. 76. fig. 1.) "Leaflets in three pairs, inerexy egg-shaped, smooth; inner ones rounder, with a globular gland between them." A shrub. Stem six or eight feet high, singed, branched near the summit; branches cylindrical, somewhat Leaflets alternate. Flowers bright yellow, vented; from three to five together in axillary, penduncled racemes, held longer than the leaves. Legumes, according to Pluurn, long, cylindrical, divided in their whole length into two cells, forming contiguous tubes. La Marck, from a living plant in flower, but not perfecting its fruit. A native of South America. The bicapsularis of Millar is an annual plant, a foot and half high; with a erect, herbaceous stem, three pair of oval leaflets to each leaf; the flowers yellow, small, axillary, solitary; pods taper, a native of the West Indies and Madeira. It must therefore, as professor Martyn observes, be a different species. 11. C. emarginata, Linn. Sp. Pl. 7. Mart. 8. Lam. 10. Wildfl. 8. (C. minor hexaphylla, foma folis, Sionen Jan. 2. p. 44. tab. 182. fig. 1, 5, 34. Brown Jan. 22. 7. Swartz. Obs. 157. C. racemosa; Mill. Dict. 19.) "Leaflets in three pairs, egg-shaped, rounded, emarginate, equal." Linn. "Leaflets in three or four pairs, egg-shaped, almost entire; flowers in irregular racemes, stem arborescent." Swartz. A small tree. Trunk ten or twelve feet high; branches round, ash-coloured, pubescuent. Leaves scattered, spreading; on round pubescent petioles, two inches long; leaflets petioled, blunt, nervet, thickish, tormentos, hoary underneath. Flowers yellow; racemes axillary, solitary, spreading, shorter than the leaves, many-flowered; three leaflets of the calyx larger, ovate-oblong, spreading, concave-arched, pubescent on the outside; petals unequal; upper one larger, in shape of the letter S placed obliquely, concave, waved at the edge; filaments very short, equal, awl-shaped; anthers thick, curved in, fertile. Leaves flat, broad. Swartz. A native of Jamaica, where it is called the wenn tree. Its leaves are purgative, and are sometimes used instead of the true fenna. The pulp of the leaves has the fame flavour and the fame medicinal qualities as cahia fistula. 12. C. obtusiflora, Linn. Sp. Pl. 8. Mart. 9. Lam. 11. Wildfl. 9. Swartz. Obs. 139. (C. americana folis subtundmis, Tourn. 6. 9. C. fustida; Dill. Elth. 71. tab. 62. fig. 72. Senna minor, Sionen Jan. 2. p. 47. tab. 185. fig. 53.) "Leaflets in three pairs, egg-shaped, rather obtuse." Root annual. Stem two feet high, cylindrical, smooth, greenish, herbaceous but strong, branched. Leaflets a little narrowed towards the base. Obtuse, with a small point at the summit, green, soft; upper ones larger; petals one a villous; a conical gland between the lower pair. Flowers in short axillary racemes near the top of the stem and branches. Lam. A native of the West Indies. 13. C. senanaitis, Wildfl. 10. Icar. rar. 1. p. 79. Collect. 1. p. 74. "Leaflets in three pairs, elliptical, obtuse, with a gland between the lower pair." A tree. Stipules awl-shaped. Leaves alternate. A native of the East Indies. 14. C. acuminata, Wildfl. 11. (C. spoucousia; Lam. 5. Aubl. guian. 1. p. 79. tab. 146.) "Leaflets in three pairs, egg-shaped, acuminate, with a stellate..."
feet or gland between each pair." A tree. Trunk seven or eight inches in diameter, branches spreading. Leaves alternate; leaflets sessile, smooth, the upper ones the largest, petiole winged, ending in a short point. Flowers yellow, with red veins, in small racemes which are either axillary or on the naked part of the stem and branches. A native of Guiana. 17. C. coriophora, Lam. 12. Willd. 12. Bot. Mag. 63. "Leaflets in three pairs, lanceolate, somewhat falcate, smooth; a gland between the lowest; corioryms peduncled, axillary, legumes cylindrical." A shrub. Stem about six feet high, brown, dotted, rough, about the thickness of a finger, branching near the top into a loose but tolerably regular head. Branches smooth, cylindrical, greenish, small. Leaflets green, quite smooth; upper ones longer, narrower, and more falcate. Flowers bright yellow, from five to seven in a corimb. Legumes inflated, cylindrical, an inch and half long, four lines thick, straight, quite smooth. A native of South America about Buenos Ayres, described by La Marek from a living plant, and a dried specimen of the legume gathered by Copeson. 16. C. villifera, Mart. 41. Miller Dict. 4. Howt. MSS. "Leaflets in three pairs, oblong-ovate, entire, yellow; pods jointed; flume erect, peduncles hoxiform." A tree. Trunk fourteen or sixteen feet high; branches numerous. Flowers pale straw-colour, small, in loose terminal branches. Legumes long, narrow, jointed. Seeds oval, brown, each lodged in a port of thorns. A native of Campaspe. 17. C. woifera, Mart. 42. Mill. Dict. 5. Howt. MSS. "Leaflets in three pairs, ovate-acuminate, villous; flowers foliarly, axillary; legumes erect." Root annual. Stem single, feldom more than a foot high, herbaceous. Flowers yellow, small. Legumes two inches long, narrow, taper. A native of Campaspe. 18. C. longiflora, Linn. jun. Supp. p. 230. Mart. 11. Lam. 13. Willd. 13. (C. argoreefcos difflua; Brown Jam. p. 223.) "Leaflets in four pairs; upper ones lanceolate; an awl-shaped gland below the lower ones and between the upper ones." Root perennial. Stem erect, somewhat cylindrical, obtusely furrowed; branches scarcely pubescent. Leaflets green, paler underneath, oborate-oblong, quite smooth; upper ones rather linear than lanceolate; an oblong-awl-shaped gland between or below the lowest pair, a more acute one between the uppermost, fildom any between the intermediate ones; petiole erect, roundish. Stipes near, acute, florius. Leaves tetragonal, hairy. Leaflets six or seven, the flanks during the night with its petioles closely ered, and its leaflets pendulous near the flme. A native of America. 19. C. minimus, Mart. 45. (C. biflora; Mill. Dict. 14. Howt. MSS.) "Leaflets in four pairs, oblong-ovate; stems procumbent; flowers axillary; peduncles two-flowered." Root annual. Stems two or three, slender, pubescent. Leaflets pale green, roundish. Flowers small, yellow; peduncles jointed. 20. C. falcatum, Linn. Sp. Pl. 10. Mart. 10. Lam. 14. Willd. 14. "Leaflets in four pairs, ovate-lanceolate, retrorsicate; a gland at the base of the petioles." Root annual. Leaflets tapering to the base, almost felter; the inner side fiddle; outer side fiddle most near the base, so that they appear curved backwards. A native of America. 21. C. fletes, Mart. 49. Willd. 15. Swartz. prod. 66. Flor. Ind. Occid. 2. p. 724. (C. ffortia; Jacc. ic. rar. 3. tab. 459. Collect. 2. p. 563. Psammirobiza 2. Plf. Braf. 185.) "Leaflets in about four pairs, egg-shaped, hairy, with an awl-shaped gland between each pair; peduncles four-flowered; legumes tetragonal." Root annual. Leaflets ciliate. A native of Jamaica in open spots on the hills elevated mountains. 22. C. grandiflora, (C. Chinenis; Lam. 15. Van-Bezian-naam feu Telz-dian-Zan Zinicum. Conf. Flora flavus; Rumph. Amb. 4. p. 63. tab. 23.) "Leaflets in five pairs, egg-shaped, pubescent at the edges; peduncles axillary, short, generally three-flowered; flowers large." Stem flabri-tubular, also two or three feet high, herbaceous, erect, angular, a little villous at its fomt. Leaflets green, with a fleshy globular gland between the lower pair. Flowers bright yellow, remarkably large. Described by La Marek from a living plant, said to come originally from China. As the Chinenis of Wildenow appears to be a different specie (see n. 75.), we have found it necessary to give a new trivial name to the present. 23. C. crothipodes, Lam. 16. "Leaflets in four pairs, ovate-wedge-shaped, pointed; legumes linear, jointed, erect, tomentous, terminating in a recurved point." Stem a little angular, scarcely ligneous, covered near its fomt with a rufh-coloured down. Leaves alternate, short; leaflets tomentous on both sides; their edges, nerves, and pedicles rufh-coloured; a conical, awl-shaped gland between each pair; fipules long, awl-shaped, villous. Flowers in axillary racemes, shorter than the leaves. A native of South America, communicated to La Marek by Thouin. 24. C. occidentalis, Linn. Spec. Pl. 1. Mart. 12. Lam. 17. Willd. 16. (C. americana folidzia, folis oblongis, fola pedunculata; Tourne. 3. 619. Psammirobiza. 1. Pifon. p. 185.) Seed ovoidalis; Comm. Flott. 1. p. 51. tab. 26. Shan. fam. hir. 2. p. 48. tab. 175. fig. 3. 4.) "Leaflets in five pairs, ovate-lanceolate, fexistous at the edges; outer ones larger, a gland at the base of the petioles." Root perennial, woody, fihbrous, blackish, striking deep into the earth. Stem herbaceous, two or three feet high, greenish, rough with irregularly fettered dots, fored downwards from each petiole with two grooves. Leaflets acuminate, smooth, f-exd, growing gradually larger to the upper ones; in old plants only three pairs. Flowers yellow, in loose terminal racemes. Legumes from four to six inches long, three lines broad, a little comprifled, slightly curved in the fame manner as that of C. falcatum. A native of Jamaica, where it is called finking weed. It is esteemed a powerful refolvent, and uful ingredient in baths and fomentations for inflations of the limbs. 25. C. flatflies, Linn. Sp. Pl. 13. Mart. 13. Lam. 18. Willd. 17. (C. fiquis planis; Plum. Spec. 18. Brum. Amer. tab. 77.) "Leaflets in five pairs, ovate-lanceolate, smooth; a gland at the base of the petioles." A tree about the fize of the common walnut tree. "Hod firm, whith; bark fihly wrinkled, dark brown. Flowers yellow, in terminal racemes. Leaflets six or seven, the flanks during the night with its petioles closely ered, and its leaflets pendulous near the flme. A native of Guadaloupe. 26. C. flacula, Linn. Sp. Pl. 14. Mart. 14. Lam. 19. Willd. 18. Rumph. Amb. 2. p. 83. tab. 21. Woody. Med. Bot. tab. 163. Gart. tab. 147. fig. 1. (C. flacula alexandrina; Bauh. pin. 402. Tourn. 6, 9. Rat. hir. 1746. Caffia nigra; Dod. pef. 787. Conna, Rhed. Mal. 1. p. 37. tab. 22.) "Leaflets in five pairs, egg-shaped, acuminate, smooth; pediciles without glands." A tree forty or fifty feet high. Trunk large, much branched. Leaves from three to five inches long, near two broad, equal at the base, lower ones largest, finely nerves, with a prominent midrib underneath, alternate, petioled; fipules scarcely apparent. Flowers large, yellow, veined, growing about five and twenty together in axillary racemes; partial peduncles two inches long, calyx smooth, three times shorter than the corolla; anthers oval, divided into two lobes at their base; gern flender, cylindrical, curved into a femicircle. Leaflets about two feet long, cylindrical, dark brown, moderately, with a longitudinal seam on one side, divided by transverse partitions into numerous cells, each containing one seed lodged in a fweetish black pulp. A native of Egypt, and almost all the warmer parts of the East Indies; and now naturalized in the Welt Indies and
and South America. It is the caffia foliata of the Arab and Greek physicians of the middle ages, and its pulp has been very generally employed as a mild laxative, seldom producing uneasiness in the bowels, and therefore peculiarly proper for children and delicate or pregnant women. Dr. Cullen is of opinion that it does not differ from other sweetish acid fruits, and that the pulp of prunes may be employed with equal effect. The pods of the East India caffia are of lecs diameter, smoother, and afford a blacker, sweeter, and more grateful pulp, than those which are brought from the West Indies, South America, or Egypt. The pulp is of a bright shining black colour; and of a sweet taste, with a slight degree of acidity. It differs both in odor and rectitude; readily in the former, slowly in the latter, and not totally in either: the seed has little or no activity. See Woody. Med. Bot. p. 149. The principal elementary of caffia is directed to be prepared in the following manner: take of the fresh extracted pulp of caffia, half a pound; manna, two ounces by weight; tamarind, one ounce by weight; rofe-syrup, half a pound. Beat the manna, and dissolve it, in a water-bath saturated with sea-salt, in the rofe-syrup, then add the pulp; and with the same degree of heat, evaporate the whole to an electuary of proper confection. The dose of caffia is from 3/2 to 3/4. Lond. Pharm. 1796. 27. C. poflafa, Mart. 40. Willd. 19. Hort. Kew. 2. p. 51. "Leaflets in five pairs, oblong, somewhat acute, smooth; a gland at the base of the petiole; branches with an even furfuce." Root perennial. Leaflets sometimes in fix pairs. It differs from C. occidentalis and planifolia in the leaflets not tapersing to the extremity. A native of the West Indies, introduced into England in 1778. 28. C. pilofa, Linn. 12. Mart. 16. Lam. 21. Willd. 22. Swartz. Ob. 160. (C. fuffruficola erica hiftrux; Brown Jam. 224.) "Leaflets in five pairs, without glands; biplices ferecorate, acuminate; lem fliff, hairy." Stem somewhat shrubby, from one to two feet high, upright, redifh; branches short, nearly upright. Leaflets nearly fifole, oblong, rounded at the tip, sharp, with a very small britle fixed obliquely to the petiole, veined, a little hirifute at the edges; common petioles thicker at the base, round, hirifute; glands extremely minute, concealed in the hairs under the lower pair of leaflets. Flowers yellow, axillary, two or three together, small; peduncles one-flowered; petals nearly equal, with claws, concave. Bractes two, whitifh. Legumes nearly cylindrical, linear, pubefcent. A native of Jamaica. 29. C. lineata, Mart. 50. Willd. 20. Swartz. Prod. 66. Fl. Ind. Occ. 2. p. 729. "Leaflets in five pairs, somewhat oblong, pubefcent underneath, nearly equal; an obfolute gland under the lower pair; peduncles one-flowered." Root perennial. Stem more shrubby and rigid, with lefs hairy branches, than the preceding species. Peduncles and biplices short. Legumes linear. 30. C. atomaria, Linn. Mant. 68. Mart. 15. Lam. 20. Willd. 21. "Leaflets in five pairs, egg-shaped, some- what tomentous; petioles round, without glands." Stem the height of a man, woody, alif-coloured, much branched: little branches and petioles scarcely feebly pubifcent; pe- tirole cylindrical, not channelled,befprinkled with small fult-coloured points. Leaflets green on both fides, pubefcent to the touch; lower ones not smaller, more obtufe, somewhat emarginate, equal at the base; biplices awl-shaped, often permanent. 31. C. fruticifrons, Mart. 43. Mill. Dict. 2. Houil. M.SS. "Leaflets in five pairs, egg-shaped, smooth; outer ones longer; lem shrubby." Stem five or fix feet high, much branched towards the top. Flowers yellow, in loose racemes lateral and terminal. Legumes long, taper. Seeds in a double row. 32. C. arborifolius, Willd. 40. not of Miller. ScL n. 5. Vahl. Symb. 5. p. 56. (C. Glauca, Lam. Wellia Taggeta Rhed. Mal. 6 p. 17. tab. 9. 16. "Leaflets in about five pairs, elliptical, smooth; an oblong gland between the lowest; biplices awl-shaped, curved; racemes axillary." "Leaflets in fix pairs, egg-shaped, glaucous and veined underneath; glands oblong, fever; legumes linear, straight, compressed, mucronate." Lam. A shrub five or fix feet high. Branches pubescent at their summit. Leaflets two inches and a half long, more than one broad, a gland between each pair. Flowers yellow in axillary racemes at the summits of the branches. Legumes four or five inches long. Lam. A native of the East Indies. As both Willdenow and Linnæus refer to Wehmann of Rhed, we have put their species together, although we do not think a shrub only fix feet high can any propriety be called arboreceus. Linnæus's definition was formed from specimens in flower, and young fruit lent by Sommerc. 33. C. Senoa, Lam. Sp. Fl. 9. Mart. 15. Willd. 24. (C. lancolata, Lam. 22. Forskall Egypt. 87. p. 58. Senoa officinallis; Gart. Senoa alexandrius; Bann. pin. 307. Tourn. 6. 8. Reih. hist. 1742. Morin. 5. 2 tab. 24. fig. 1. Sena orientalis; Tabern. i. 517.) "Leaflets in five pairs, lanceolate, equal; a gland above the base of the petioles." Lam. from Forskall. Stems from two to three feet high, somewhat woody; branches flender. Leaves alternate; leaflets an inch long, lively green, smooth, on short petioles. Flowers pale yellow, in terminal racemes, on long peduncles. Legumes oblong, recurved, compressed. Lam. Legumes ovate-kidney-shaped, membranous, compressed, with foliaceous appendages, protuberant at the seat of the seeds; marked by capitular, transverse, parallel strie; from fix to nine-celled, two-valved; partitions transverse, very thin. Gart. A native of Arabia and Upper Egypt, whence the leaves are brought to Grand Cairo; and as Alexandria is the port from which it is shipped for Europe, it has obtained the name of Alexandrian fenna or fen. The leaves of fenna, as they are imported for medicinal use, have a rather disagreeable smell and a somewhat acrid, bitter, nauseous taste; they give out their virtue both to watery and spiritous meftrix, communicating to water and proof spirit a brownifh colour, more or less deep according to the proportion. It is commonly called a feem spirit. As far as is now known, it was first introduced as a purgative by the Arabian physicians Scorpion and Mefue, who flourished about the beginning of the ninth century. The firth of the Greeks by whom it is noticed is Aetaurus in the thirteenth. Aetaurus, however, speaks not of the leaves but the fruit. Mefue likewife seems to prefer the pod, as more efficacious than the leaf. In fact the pod purges less powerfully than the leaves, but has the advantage of not gripping the bowels, like the leaves, and of being without their nauseous bitternefs. For covering the tale of fenna, Dr. Cullen recommends coriander seeds; and for preventing its griping, the warmer aromatics, as cardamoms or ginger. The formule of fenna given by the colleges, are those of an infusion, a powder, a tincture, and an electuary. See Woodville's Medical Botany. The London Pharmacopeia, 1796, directs the simple infusion of fenna to be prepared by macerating 1/4 oz. by weight of fenna, 1 dram of powdered ginger by weight, and one pint of boiling distilled water, for one hour, in a covered vefsel, and straining the liquor, when cold. For the tartarified infusion of fenna, take of fenna 1/4 oz. by weight, bruised coriander 1/2 an ounce by weight, cryftals of tartar 2 drams by weight, and one pint of dis- tillated water. Boil the cryftals of tartar in the water, until they are difolved; then pour the water, yet boiling, upon the fenna and seeds; mace rate for an hour in a covered vef-
The text appears to be a page from a botanical book, discussing Cassia, a genus of flowering plants. It includes information on the leaves, flowers, and other characteristics of the plant. The text is written in Latin, and it seems to be a detailed description of the plant's anatomy and morphology.

Propagation and Culture. Some species of Cassia are cultivated for their beauty, and others for their rarity. They are all propagated by seeds, but as they are natives of warm climates, they must be reared in hot-beds. Such as grow naturally between the Tropics, require the protection of a roof; and few will endure the rigour of our winters in the open air. The seeds of Cassia fistula may be procured from the druggists, who import the pods for official purposes.

CASSIA CINNAMONUM, Herm. Lindg. See LAURUS CINNAMOMUM.

CASSIA MALABARICA, Herm. Lindg.—Ligneae. Black—cinnamomea, Pluk. Alm. 88, 89. See LAURUS CASSIA.

CASSIA LINEI JAMAICAENSIS & CASSIA LINEI BARBADENSIS, Pluk. Alm. See CANNELLA ALBA.

CASSIA, in Geography, a country of Sumatra, the inhabitants of which live in villages, independent of one another, and are always at war. See SUMATRA.

CASSIA FLAVA, in the Glass Trade, is that iron with a piece of wood placed on it, on which they lay the glasses after they have taken it off the pipes, and on which they turn the glasses, to soften the pontic to it.

CASSIAN, JOHN, in Biography, an ecclesiastical writer of the chas of monks, was most probably born in Syria, though others say that he was a native of France, and others
of Africa. He was brought up in the monastery of Bethle- 
hem, where he formed an intimacy with a monk named 
Germanus; and from whence he went together into Pale-
stine and Egypt, and passed seven years with the solitaries of 
the Thebais. The theological disputes that prevailed even 
in these deserts, occasioned their withdrawing to Constan-
tinople, where Caiffan was ordained deacon by St. Chryfodom. 
Upon the expiration of this prelate from his see, he was de-
puted, together with Germanus, in 403, to lay the com-
plaints of the church before pope Innocent I., by whom he 
was ordained priest. When Rome was taken by Alaric, he 
removed to Provence, and in 410 fixed at Marcellis. Here 
his founded two monasteries, one for each sex, and inculca-
ted in Gaul, both by his discourse and writings, the opinions 
of the Semipelagians on the doctrine of grace, together with 
the rules of discipline which were observed among the Syrian 
and Egyptian monks; and here he is supposed to have died, 
between the years 430 and 433. His works, some of which 
detailed the mode of living among the Egyptian monks, and 
the discourses of their most famous abbots, were published in 
folios in Frankfort, in 1722, with a large commentary by 
Alaric Gaut. Caiffan has been regarded as a faint by 
several popes; and though he was never canonized by the 
church, his memory has been so much revered in Provence, 
that a day was observed as his festival; and his works were 
held in very high estimation by the devotees of the church 
theim, E. H. vol. ii.

CASSIANI, a feit in Cival Laws, who adhered to the 
system and interpretations of Caffius, a celebrated lawyer, in 
opposition to those of Pegasus, a timid flame of Domitian, 
who derived his name from the galley which his father com-
manded, whose adherents were denominated Pegasifani. 
These parties were also denominated Sabiniarios and Procu-
lians. See Capito. The popular canes was in the hands of 
Pegasus, while the favourite of the Caafars was repre-
ented by Caiffan, who gloried in his defeat from the patriot 

CASSIANISM, from Caffian, a teacher in Gaul to those 
who were called Semipelagians towards the close of the fifth 
century, is sometimes used for Semipelagianism. See Cas-
stian.

CASSICAN, in Ornithology, caffican de la nouvelle Gui-
née, Buffon: the pied roller of Latham, Coracias varia, 
which see.

CASSICUS. Brifon calls the oriois Pericuss by this 
name, cafficus luteus. See ORIOUS PERICUS.

CASSIDA, in Botany, Tourn. Hall. Ray. Petiv. See 
Scutellaria.

CASSIDA, in Entomology, a genus of coleopterous in-
sects, which, according to Linneus, have moniliform anten-
nae that become rather thicker towards the end: thorax 
and wing-cases with a broad margin, the former flat, and 
forming a kind of shield, beneath which the head is concealed. 
To this Mr. Marsham adds, that the body is oval, convex, 
and flat beneath. Marsh. Ent. Brit. The Fabrician char-
acter as usual is taken principally from the parts and struc-
ture of the mouth: he observes that the anterior feelers are 
elated, and those behind filiform; lip elongated and en-
tire, and the antennae moniliform.

The above are the essential characters of this genus, to 
which a few general particulars may be added. The retu-
aduate figure of the body, gibbous back, and flattened fur-
face beneath are a strong criterion of this genus. The surface 
above is commonly smooth, and in some species glossy; 
eyes oval, and placed near each other; antennae inserted be-
tween the eyes; scutel triangular and small; wing-cases 
fame length as the abdomen; legs short, thighs compressed, 
shanks rounded, and the tarsi consisting of four joints. 
Many of the species are very beautiful when alive, some of 
which retain their brilliancy of colours in the height of per-
fusion after death; in others, however, and those especially 
of a small size, these are altogether evanescent, their 
rich metallic or golden hues fading as the insect dies, and 
totally disappearing in the dried specimens. Caaffida im-
merced in spirit of wine alive, are observed to retain the 
splendour of those golden hues for years in as high perfecti-
on as they appear in the living insect: but if taken out 
and allowed to dry, these change colour in the same manner 
as the insect would in dying with not being steeped in spiri-
to. For immediate observation, the true colours of the 
living insect may however be revived in the dried specimens 
at any time by leaving them for the space of fifteen or twen-
ty minutes in warm water; the colours re-appearing while 
the insect is kept moist, and fading again as the insect dies.

The larvae of the caffidae are commonly found concealed 
on the under surface of the leaves of the plants on which 
they feed, and often hide themselves under a cover of their 
own excrements, which they support in the air above their 
odies by means of their lateral spines, and the bristles at 
the extremity of their tail to shelter themselves from the sun 
and rain. The larvae call their skins several times before 
they pass into the pupa state. The perfect female insect 
deposits the eggs in regular order on the leaves of plants, 
and covers them with excrements to conceal them. The 
common English name of the insects of this tribe is the to-
toise beetle. We have only an inconsiderable number of the 
species indigenous to this country, and those only of a small 
size; many of the larger kinds, and those distinguished for 
their vivid hues and colours are natives of South Ame-
rica. The following species are described by authors.

VIRIDIS. Green sprinkled with confluent dots. Marth. 
Ent. Brit. Caifida viridis. Linn. La caffide verte de 
Geooffroy. Frequent on thistles in Europe. Length one 
third of an inch.

CAESSENTIA. Green, with a fanguineous dot near the 
Inf. Caifida fanguineolenta of Paykull.

SIMILIS. Green; wing-cases triate with dots. Found 
on anthemide cotula. Marth.

Obi. Perhaps caffida prasina of Herbst. Inhabits Eu-

SPERGULII. Pale green; shield smooth; wing-cases 
triate with impressed dots. Discovered by Mr. Kirby. Marth. 
Ent. Brit.

MURRAEA. Black; shield red; wing-cases fangue-
itous, sprinkled with black dots; named by Fabricius after 
Murray. Size of caffida viridis, and inhabits Europe.

LIRIOPHORA. Black, above green; thorax emarginate; 
future and two dots on the shells black.

EQUESTRIS. Green; a silverly streak at the top of 
the wing-cases; abdomen black, with a pale border. Olivier. 
A native of Germany: found on the water mint.

NEBULOSA. Pale clouded and dotted with brown. Linn. 
Found on thistles in Europe.

MACULATA. Greenish, with numerous black spots on the 

NOBILIS. Greenish-grey, with a shining blue line on 
the wing-cases. Found principally on thistles, and inhabits 
Europe. Donov. Inf. &c.

SPPINIDULAE. Grey, with a coppery gold line, and 
feather in the middle of the wing-cases near the apex. A 
new British species allied to caffida nobilis. Marth. Ent. 
Brit.

5 D 2
CASSA. Deep black; anterior part of the shield fuscous. Inhabits Germany. Fabr.

AFFINES. Wing-cases grey, dotted with black; thorax yellowish, and without spots. Inhabits Europe. Olivier.

AUSTRIACA. Thorax and wing-cases dusky, dotted with black; margin fuscous and immaculate. A native of Austria.

CIBRASIA. Reddish; thorax with four black dots; those on the wing-cases numerous; shield emarginate. Inhabits America. Olivier.

DEBUSA. Reddish; numerous blue black dots on the wing-cases, and two on the thorax; shield entire. A native of New Holland. Olivier.

OCTOPUNCTATA. Reddish; thorax with two blue black dots; wing-cases with four on each. Inhabits Siam. Fabr.

INTERUPTA. Yellowish; thorax immaculate; wing-cases with a broad black interrupted line. Inhabits New Holland. Fabr.

ST. CRUCIS. Tesselaceous; wing-cases golden with three tubercles at the base; margin pale, with two black bands beneath.

SEX-PUNCTATA. Yellowish; disk of the wing-cases ferruginous, with six black dots. Inhabit Cayenne. Fabr.

ANNUVLUS. Yellow; disk of the wing-cases black, with two yellowish rings, and posterior band. Inhabit Cayenne. Fabr.

JUDICA. Ferruginous; disk of the wing-cases marked with impressed dots, and spots of black. Found in South America. Fabr.

HEBAREA. Pale, with numerous small black lines. Inhabit Cayenne.

CINCTA. Thorax and wing-cases dusky, with yellowish margin; wing-cases with a white hyaline spot before the edge. Inhabit Africa.

MARGINELLA. Green; margin of the thorax and wing-cases yellow. A native of Brazil.

LIMBATA. Head, thorax, and wing-cases dusky, with reddish margins. Found in Germany. Olivier.

FERRUGINEA. Black; thorax and wing-cases ferruginous and immaculate. Fabr. Cassida subferruginea of Schrank. Smaller than cassida viridia, and inhabits Germany. Rarely found in England.

VIBEX. Greenish; dorsal future fuscaceous. A native of Germany. Olivier.

AFFINES. Wing-cases greyish, with black dots; thorax yellowish, and without spots. An European species described by Fabricius.

TRUNCATA. Rufous; wing-cases slightly reticulated, and spotted with black; back gibbous. Fabr. This is of a large size; native place unknown.

GIBBOSA. Black, with two villous golden spots; wing-cases reticulated with greenish; an oblique spine on the future. A large species, described by Fabricius as a Brazilian insect.

BIDENS. Black; anterior part of the wing-cases projecting, and an erect spine at the future. Inhabit the same country as the preceding, and is of a large size.

SPINIFEX. Ferruginous; wing-cases with a projecting spine at the anterior angle; thorax with a transverse spine on each side. Inhabit India. Voet.

BICORNIS. Cyaneous; a truncated spine at the anterior angle of the wing-cases. Inhabit South America.

PERFORATA. Tesselaceous; wing-cases spinous at the anterior angle, and perforated at the base. Pallas.

JAMAICENSIS. Pale yellow, brassy; wing-cases immaculate with hollow dots. This kind inhabits Jamaica. Olivier.

Margaritacea. Greenish; wing-cases polished silvery green; head and breast black. Inhabit Saxony. Schaller.

FASTUOSA. Black; wing-cases brassy red, with black spots. Inhabit the same country as the preceding. Schaller.

FUSCA. Tawny, with two raised lines on the wing-cases. Laidhart.

CRUCIATA. Pale; disk black, with four yellowish spots. Fabr. Spec. inf. Found on plants in Europe.

CRUX. Yellow; thorax with a ferruginous dorsal line; disk of the wing-cases ferruginous, with four yellow spots. Fabr. Inhabits Cayenne, and is strongly allied to C. cruciata.

UNDECIMPUNCTATA. Yellowish, single dot in the middle of the thorax, and eleven on the wing-cases black. A native of Cayenne. Fabr.

BIFASCIATA. Pale; body with two fuscous bands. Inhabit South America. Gmelin.

FLAVA. Yellow, and without spots; body tesselaceous, with a black spot on the feutel. Fabr. Found in the south of Europe.

PURPUREA. Yellow; body above purple. This is a small species, and inhabit America.

LEUCOPHORA. Tesselaceous; margin dotted with yellow. Found in America. Linn.

TUBERCULATA. Tesselaceous; margins yellow; three tubercles on the wing-cases. Inhabit Sierra Leon.

BITUBERCULATA. Brown, with white margin; wing-cases spotted with black; and a single tubercle at the base. A native of Cayenne. This is greatly allied to tuderetata, but is only half the size.

SUTURALIS. Brown; wing-cases yellow, with brown future. An African species. Fabr.

BIGUTTATA. Thorax yellow; wing-cases reddish; margin black, with two yellow spots.

MILLARIS. Yellow; thorax immaculate; wing-cases dotted with black, and two marginal bands. Inhabit the island of St. Helena.

PUNCTATA. Black; shield brown; wing-cases yellow, with black spots.

RETICULARIS. Yellow; wing-cases variegated with azure, and a fuggle lateral band. Fabr. A species of large size found in South America.

VARIEGATA. Rufous; wing-cases variegated with azure, and a fuggle lateral band. Inhabit America.

TRIFASCIATA. Rufous; wing-cases with three lateral bands. Fabr. This kind inhabits India.

ANNULATA. Azure; two spots on the thorax, and six rings on the wing-cases, rufous. Fabr. Is of a large size; inhabit South America and India. A variety of this insect is described by Herbit under the name of cassida ornata.

GRAESSA. Sanguineous; disk of the wing-cases sprinkled with black dots, and ramose black lines on the margin. Inhabit South America.

CLATHRATA. Ferruginous; margin of the wing-cases, longitudinal line, and one half transversely black. Described by De Geer. This species is a native of India. The thorax is immaculate; wing-cases very broad. The female is distinguished by having three distinct lines across.

SEPTEM-GUTTATA. Black, with seven white spots on the wing-cases. Gmelin. This is rather an ambiguous species.

EXCLAMATIONIS. Yellow, with three black lines, the middle one interrupted, and resembling the note of exclamation, (!). This inhabit South America. Fabr.

LINEATA.
**Linata.** Greyish, with four whitish lines on the wing-cases. Fabr. Inhabits the Cape of Good Hope.

**Jamaicensis.** Pale brassy yellow; wing-cases immaculate, with hollow or excised punctures. Fabr. Described by Sloane in his Natural History of Jamaica.

**Dorsata.** Thorax and wing-cases dull, the last with a spine in the future, and whitish at the margin; base dullky. Fabr. Inhabits South America.

**Quadrifusulata.** Thorax dull; wing-cases fungous; margin blue, with two red spots. Inhabits America.

**Cyanea.** Brassy blue; wing-cases immaculate, with excised dots. A Limnean species described by Petiver and Deger. Inhabits America.

**Marginata.** Wing-cases telfaceous; body and wing-cases edged with black; thorax brassy. A native of South America.

**Nigra.** Brassy ferruginous; wing-cases with a subovate yellow spot in the disk. Inhabits the same country as the preceding.

**Supposita.** Wing-cases black, annulated anteriorly, with a linous dot in the middle. A small American species. Lechem.

**Lateralis.** Brassy fuscous, with a yellow lateral spot on the wing-cases. De Geer, Subzer, & c. Inhabits South America.

**Decisata.** Brassy green, with two approximate yellow spots on the disk of the wing-cases. Fabr. Cassidia quadriraculata. Deger. Inhabits South America.

**Decimens.** Bluish black; wing-cases spotted with yellow; the dorsal spots reticulated, those on the sides ditinct. Inhabits Jamaica. Fabr.

**Bipunctata.** Yellowish, with two black spots on the wing-cases. Fabr. Inhabits India.

**Bipustulata.** Green, with two lateral fanguineous spots on the wing-cases. Linn. Amcan. Acad. A native of Cayenne.

**Sex-pustulata.** Azure, with three red spots on the wing-cases. Inhabits Brazil. Fabr.

**Sexdecim-pustulata.** Black; two dots on the thorax, and seven on the wing-cases red. Fabr. A native of South America.

**Angustata.** Yellowish; wing-cases narrowed behind. Gen. Inhabits India.

**Bittuberulata.** Brown, with a white margin; wing-cases spotted with black, and a single tubercle at the base of each. Fabr. Inhabits Cayenne. This species is allied to cassidia tuberculata, but is only half the size.

**Taurus.** Black; wing-cases with a truncated spine at the anterior angle. Inhabits Cayenne. Fabr. Refleches C. bicorinum, except in being rather smaller.

**Retiformis.** Black; thorax with two yellowish spots; wings yellow, reticulated with black. A native of Cayenne. Fabr.

**Palliata.** Black; thorax villos greenish; wing-cases greenish, with the margin and middle line ferruginous. Fabr. Inhabits Cayenne.

**Rubiginosa.** Ferruginous; thorax and wing-cases fuscous, dotted; outer margin ciliated. Linn. This species is found in Europe.

**Cuprea.** Above coppery; edge of the thorax, and two marginal spots on the wing-cases rufus. A native of Cayenne.

**Nitens.** Black; thorax and wing-cases grey, glossed with gold; legs livid. Linn. Native country unknown.

**Superba.** Black; wing-cases dotted, and with the shield golden green; antennae, abdomen, and legs greenish. A Limnean species. This is found in Europe; the golden hue mentioned by Limens varifies at the time the insect dies.

**Sanquicolenta.** Golden yellow; oval ring on the wing-cases, and tubercle on the future fanguineous. Inhab. America.

**Acuta.** White, with a common black disk; the border, oval ting, and posterior arched blue fine yellow. Sweden. A native of Rio Janeiro. This is of the middle size, and has the breast and abdomen black.

**Cassida.** In the Ancient Geography, a town of India, on this side of the Ganges. Potenii.

**CASSIDARIUS.** An ancient name given by the Italians and Germans to a sort of heads made of the yellow and red chalcodony, a very beautiful stone, or of an agate resembling it in colour. They also call the stones themselves by this name; but are by no means determinate in the meaning of the word, not restraining it to any one peculiar species.

**CASSIDONIA.** In Botany. Ril. Hist. Plant. See LAVANDULA STATIACHAS.

**CASSII.** In Ancient Geography. See CATTIVELLALI.

**CASSILLACUM.** A town of Rhettia Prusa, now called Roma-Kesself.

**CASSIMBUZAR.** In Geography. See CASSIMBA-ZAR.

**CASSIMER, or CASINER.** In Commerce, a thin twilled wooden cloth, much in use for summer wear.

**CASSIMIRE, or CASHMERE.** In Geography. See CASHER.


**Gen. Ch. Cal. perianth small, five-cleft, permanent. Core deeply five-cleft, fo as to be almost pentapetalous; segments somewhat egg-shaped, spreading, larger than the calyx.

**Stam. Filaments five, awel-shaped, alternate with the segments of the corolla; anthers roundish. Fil. germ superior, conical; style none, stigmas three. Peric. Berry dry, deep-paucious, roundish, three-celled, unedicated with the stigmas. Seeds solitary, homestaw egg-shaped.

**Eff. Chi. Calyx five-cleft; corolla deeply five-cleft; segments alternate with the ilamens. Stigmas three. Berry dry, three-celled, three-seeded.

or dull red. Leaves generally opposite, smooth, convex above, particularly the upper ones, with the edges a little reflected underneath. Flowers small, white, in short axillary bunches or corymbs, three or four together, on a slender common peduncle; filaments inserted into a flat disk which surrounds the germ, and covers the face of the corolla. A native of South Africa. 1. Cassina, Lam. Illus. 2. "Leaves alternate, ovate lanceolate, acute, obtusely serrated; flowers axillary, nearly subulate." A native of Magellan found by Commenon.

Propagation and Culture. The first two species have long found a place in European collections on account of the beauty of their leaves, which continue on the tree all the year. They require no artificial heat, but must be removed into a well-sheltered greenhouse in the winter. The best method of increasing them is by laying down the shoots that are nearest the ground, which should be twisted to facilitate their throwing out roots. Those which are laid down in autumn will be fit to remove in the autumn succeeding. They may be propagated also by cuttings; but in this case they will seldom be rooted enough to transplant in less than two years. The full kind is the leaf hardy, requires greater care in winter, and seldom runs its seeds in England. The other produces plenty of fruit, and cultivates the greenhouse through the winter. All of them, however, are propagated by any of the usual methods for the kind from profecuting his astronomical studies and observations. He discovered many particulars relating to the planets Mars and Venus, and more especially the revolution of the former round its axis; and he directed peculiar attention to the theory of Jupiter's satellites, which after much labour, and many observations, he settled with accuracy, and published at Rome, among other astronomical pieces, in 1660. When Picard, the famous French astronomer, had an opportunity of examining these tables, he found them so accurate that he conceived a high opinion of the skill and judgment of the author, and they contributed so much to extend his reputation that he was invited to become a member of the Academy of Sciences, established about this time by Lewis XIV. As he could not leave his station without the permission of his superiors, the French monarch applied to the pope and senate of Bologna for that purpose; and they granted him leave of absence for 6 years, so that he came to Paris in 1669, and was immediately appointed royal astronomer. At the expiration of the stipulated term, the pope and senate of Bologna infirled his return, but it was threatened by his government and envoys, which had been hitherto continued without interruption; but he was nevertheless prevailed upon by the minifter to remain in France, where he was naturalized in 1673, and about the same time entered into the marriage state.

The royal observatory having been completed in 1670, Caffini took possession of it in the following year, and affiduously prosecuted the duties of his profession. In 1672, he determined the parallax of Mars and the sun, by comparing some observations which he made at Paris with others that were made at the same time in America; in 1677, he demonstrated that the diurnal rotation of Jupiter about its axis was performed in 9 hours 58 minutes, by means of the motion of a spot in one of his larger belts; and in 1684, he discovered four satellites of Saturn, in addition to that which Huygens had before observed. A new edition of his "Tables of Jupiter's Satellites," corrected by later observations, was published in 1693; and in 1695, he visited Bologna for the purpose of examining the meridian line which he had fixed there in 1653, and by the present of his rice to the rector of Bologna, in the presence of several eminent mathematicians, that it had not for forty years undergone the least variation. In 1700 he continued the meridian line, begun by Picard, to the most southern limits.
limits of France. Cassini was a resident at the Royal Observatory of Paris more than 40 years; and in that long period he did the greatest honour to the establishment by various observations and discoveries, which it would far exceed our bounds to recite in this article, but which will be duly noticed in their proper places. The titles of his publications occupy nearly five pages in the closely printed index of Römer. He had the misfortune to be deprived of his sight during the latter years of his life; and he died on the 14th of September, 1712, at the age of 87 years. Mem. of the Paris Acad. for 1714.

Cassini, James, the younger son of the former, was born at Paris in 1677; and having studied mathematics and philosophy, filled his father’s shoes, and afterwards at the Marais college under Varignon, who was mathematical professor, his proficiency was such that at the age of 15 years he acquired great reputation in supporting a mathematical thesis. When he was 17 years old, he was admitted a member of the Academy of Sciences, and at this time accompanied his father to Bologna, and assisted him in verifying the meridian, and other operations. On his return he took a journey to Holland, where he discovered some errors in the measurement of the earth by Snellius, the result of which was communicated to the Academy of Sciences in 1702. In 1696 he visited England, and became a member of the Royal Society. In 1712 he succeeded his father as astronomer royal at the observatory. In 1717 he communicated to the academy his researches on the distance of the fixed stars, in which he showed that the whole annual orbit is a mere point in comparison with this distance; and in the same year he prefented his discoveries concerning the inclination of the orbits of the planets in general, and especially of those of Saturn’s satellites and ring. In 1725 he undertook to investigate the cause of the moon’s libration. See Libration. His attention was directed in 1732 to an important question relating to the planet Venus. The diurnal rotation of this planet had been determined by his father to be performed in 23 hours, and in a work published by Bianchini in 1729, it was settled at 24 days eight hours. Cassini upon examining Bianchini’s observations of the spots of Venus, found that he had intermitted his observations for three hours, and thus had probably been led to mistake new spots for old ones, so as to deduce from the whole an erroneous conclusion. Soon afterwards Cassini ascertained the nature and quantity of the acceleration of Jupiter’s motion, at half a second in the year, and of the retardation of Saturn’s at two minutes annually; and that these quantities would go on increasing for 2000 years, and then would decrease again. In 1740 he published his “Astronomical Tables,” and his “Elements of Astronomy;” both of which are very comprehensive and accurate works. Cassini, though he particularly excelled in the department of astronomy, extended his researches to other branches of science. Accordingly he published some experiments on electricity, or the light produced by friction; the recoil of fire-arms; the ascent of the mercury in the barometer at different heights above the level of the sea; the improvement of burning glasses, &c. In 1700, he affixed his father in the measurement of the meridian; and in 1718 he finished the operation begun by M. de la Hire north of Paris, in concurrence with Maraldi and the younger de la Hire. Hence he was led to conclude, that the degrees of the meridian were not only of different lengths in different parts, but that they decreased more and more towards the pole; and that consequently the figure of the earth was that of an oblong spheroid, having its axis longer than the equatorial diameter. He also measured the perpendicular to the same meridian, and compared the measured distance with the differences of longitude as before determined by the eclipses of Jupiter’s satellites; and he also inferred from this measurement, that the length of the degrees of longitude was smaller than it would be in a sphere, and that therefore the figure of the earth was an oblong spheroid. These conclusions induced the French government to appoint two classes of mathematicians, one for measuring a degree at the equator, and the other at the polar circle; and the result of the whole was a determination that Cassini’s conclusions were erroneous, and that the figure of the earth was an oblate spheroid, conformably to Newton’s inference from the theory of gravity. Cassini prolonged a life of inestimable labour to an advanced period, and at length lost his life by a fall in April 1766, in the 86th year of his age. His publications were: “A Treatise on the Magnitude and Figure of the Earth;” “The Elements or Theory of the Planets,” with Tables; and a great number of papers in the Memoirs of the Academy of Sciences from the year 1699 to 1755.

Cassini, De Thury, Cesar-François, the second son of the former, inherited his talents and supported the reputation of the family in scientific researches and discoveries. He succeeded his father as director of the observatory, and he had the honour of being a member of most of the learned societies in Europe. He was born at Paris, June 17th, 1714, and received his first instructions in mathematics and astronomy from M. Maraldi and Camus; and his proficiency was such, that he was scarcely 10 years of age when he calculated the phases of the total eclipse of the sun of 1727. At the age of 18 he assisted his father in drawing the perpendicular to the observatory-meridian from Strasburg to Brd; and the business of traversing the country by several lines parallel and perpendicular to the meridian of Paris, with a view to the formation of a general chart of France, was entrusted to Cassini. He also undertook to measure the meridian of Paris by a new series of triangles, of a smaller number, and more advantageously disposed than those employed by his grandfather and father, for the purpose of obtaining a more accurate result. This great work was published in 1740, with a chart, showing the new meridian of Paris, by two different series of triangles, differing along the sea-coasts, to Bayonne, traversing the frontiers of Spain to the Mediterranean and Antibes, and thence along the eastern limits of France to Dunkirk, with parallel and perpendicular lines described at the distance of 8000 toises from one another, from one side of the country to the other. In 1735, he was admitted into the academy as adjunct supernumerary. A particular chart of France, constructed at the special request of the king, took its rise from a tour made by Cassini in Flanders, in company with his majesty, about the year 1741. He also published various works relative to these charts, and a great number of the charts themselves. In 1761, he undertook an expedition into Germany; for the purpose of continuing to Vienna the perpendicular of the Paris meridian; of unifying the triangles of the chart of France with the points taken in Germany; of preparing the means of extending into this country a plan similar to that of France; and of thus establishing successfully for the whole of Europe a very useful uniformity. His observations of the transit of Venus, on the 6th of June, 1761, made during his stay at Vienna, were published in his “Voyage en Allemagne.” Availing himself of the peace which afterwards took place between England and France, with a view to the accomplishment of his great object, he proposed the joining of certain points taken upon the English coast with those which had been determined on that of France, and thus connecting the general chart of the
the letter with that of the Bailey tiles, in a manner similar to that by which he had united it with those of Flanders and Germany. This proposal was favourably received by the English government, and carried into effect, under the direction of the Royal Society, by which the execution was committed to the late general Roy. After his death it was for some time suspended; but the further execution of it was committed, under the auspices of the duke of Rich- mond, then maker-general of the ordinance, to the care of col. Edward Williams and captain William Mudge, respecti-
able officers of the artillery, and Mr. Isaac Dalby, who had before assisted general Roy.

The volumes of the Memoirs of the French Academy, between the years 1733 and 1768, contain a prodigious number of papers communicated by M. Cassini, and consis-
ting of astronomical observations and questions; among which are "Recherches concernant le Parallax du Soleil, the Moon, Mars, and Venus; "On Astronomical Re-
fractions, and the Effect caused in their Quantity and Laws by the Weather;" and "Numerous Observations on the Obliquity of the Ecliptic, and on the Law of its Variations."

In short, Cassini cultivated astronomy for 50 years, a period the most important, in relation to that science, that ever elapsed, with regard to the magnitude and variety of objects in which he commonly obtained a principal part. His con-
stitution was strong and vigorous, and enabled him to fur-
mount the fatigue that attended those laborious operations in astronomy and geography, which he had the merit of con-
ducting. However, the last twelve years of his life were rendered painful and disheartening by an habitual retention of urine; and it was at length terminated by the small-pox on the 4th of September, 1784, in the 71st year of his age; being succeeded in the academy, and as director of the ob-
servatory by his only son, count John-Dominic Cassini, the 4th in order by direct descent in that honourable family. Hatton's Math. Dict.

CASSINIAN Curve, or CASSINOID, in Astronomy, a curve of an elliptic form, propounded by M. John-Dominic Cassini, to be the orbit of a planet. The property of this curve is, that the product of two lines drawn from its foci to any point in the curve, shall be equal to a given quantity, viz. to the rectangle under the apothem and perihelion distances of the planet; whereas, in the common ellipse, the sum of two lines from the foci to any point in the curve is equal to the sum of the above distances, or transverse diameter. M. Cassini supposed that a planet would describe this curve about the sun, in one of its foci, in such a manner that the angles at the other focus are proportional to the times, which he calls the focus, or centre of mean motion; and that in which the sun is placed, he calls the centre of true motion. Whence, any two distances of a planet from the focus of the true motion are reciprocally as its distances from the focus of mean motion. In this figure, if the left axis exceeds the distance of the foci, the curve is every where concave towards the centre; if, while the principal axis remains the same, the distance of the foci is lessened, the minor axis will be increased; and, when the foci meet in the centre, the figure will become a circle; but if, on the contrary, the distance of the foci be increased, the left axis will be lessened, and will become equal to the said distance, since the distance is to the principal axis as unity to a mean proportional between one and three. If the distance of the foci be farther increased, the minor axis will be lessened, the curve will at length have a point of contrary flexure, and will, at the ends of the minor axis, be convex towards the centre; and when the distance of the foci is so far increased, as to be in the same proportion to the greater axis as the side of a square to the diagonal, that is, as $1: \sqrt{2}$, the left axis will become nothing, and the curve extend to the centre on each side. If the distance of the foci be greater in proportion to the trans-
verse diameter, than in the above ratio, the left axis is im-
possible, and the figure turns into two conjugate ones, at a distance from each other; which, upon the increase of the distance of the foci, will be lessened, till at length the figure runs into two conjugate points. The distance of the foci increasing, the two conjugate figures do again emerge, and they increase after the same manner as they decreased before, differing from the former in the order of the foci, and of the vertices, and are increased till they become in-
finite. Afterwards, this system will again approach to a circle by the same degrees as it receded from it. After-
tracing a few of the properties of this curve, it must be evident that it cannot possibly be the orbit of a planet; for it is certain, that in all those cases, where it passes into two conjugate figures, it deviates from what is essential to the nature of an orbit, namely, continuity; and in all those cases where it is, at the end of the minor axis, convex towards the centre, the planet would need a centrifugal force to describe such parts of its orbit; that is, it would require at equal distances from the sun, sometimes a centrifu-
gal, and sometimes a centripetal force to retain it in its orbit, which is totally incompatible with all the laws of nature. It may be fairly concluded, that when all the species of a figure beyond a certain limit are unfit for discharging any office of nature, the remaining species on the other side of the limit should be rejected also: and when, in addition to this, it is considered that the celestial observations are not consistent with this curve, it can by no means be ad-
mitted into astronomy.

CASSINOMAGUS, in Ancient Geography, Chafferton, a place of Gaul in Aquitanica Prima, 30 French leagues from Germanomagus, and 17 from Augustorium or Lu-
mores.

CASSIOBERRY-BUSH, in Botany. See VIBURNUM leviatum, and Ilex comitoria?

CASSIODORUS, MAGNUS AURELIUS, in Biography, a Roman senator, born at Bruttium, on the confines of Calabria, who flourished in the time of Theodoric the Goth, in the 6th century, who died in 602, at the great age of 93, and who has been enumerated among the few Roman writers on music; but to whom neither the art nor the science has great obligations. Cassiodorus, contemporary with Boethius, has given us even less information on the sub-
ject than the excellent author of the discourses "De Consul-
tione Philosophi:" for, writing on the seven liberal arts (de septem disciplinis), all that he says concerning music is contained in one chapter only, consisting of but four 40.

tables, and these few pages, which hardly contain the skeleton of a treatise, give us nothing but repetitions of what his predecessors had said more fully. And it may, indeed, be asserted, without exaggeration, that all the Gr. and Lat. treatises that are come down to us, are but bulletins of the same calibre, which teach us no part of music but the alphabet, nor can any thing be acquired by the most inten-
tive study of them, except to dispair and the head-ache.

CASSIOPEI.A, or CASSIOPH, in Ancient Geography, a port of the sea of Epirus, in the southern part of Chonia, S.W. of the port of Panormus. Pliny, Strabo, and Pto-
lemey, mention this city; but M. D'Aubigny has not placed it in his map. Cassioph, or Cassiop, was famous on account of the temple of Jupiter Cassius, whence some derive its name.

CASSIOPÆ, a people of Greece, mentioned by Strabo, who
who inhabited Caffiopea, or Cæsir. This author assigns to Caffiopea a town and part of the same name, and three other small towns in the interior of the country. Pliny also mentions the Caffiopearis, and places them in the vicinity of the Doryphos. M. D'Anville fixes their situation on the face of it in Thespis, towards the upper extremity of the southern part of the island of Cœcyra.

CASSIOÆUM Promontorium, a promontory of the island of Cœcyra.

CASSIOPE, a town and sea-port in the northern part of the island of Cœcyra, according to Ptolemy and Strabo, who place also a promontory of the same name in this island. It is also mentioned by Cicero and Pliny.

CASSIOPIA, a town of Greece, in Caffiopea, according to Ptolemy. He places this in the mountains, and more easterly than the other.

CASSIOPIA, or CASSIOPEIA, in Fabulous History, wife of Cepheus, king of Ethiopia, and mother of Andromeda. Believing that she was more beautiful than the Nereids, they were so incensed that they besought Neptune to revenge the affront; upon which he sent into the country of Cepheus a sea-monster, who committed dreadful ravages. In order to appease the god, Andromeda was chained to a rock, and exposed to the monster; but was rescued by Perseus, who married her, and obtained of Jupiter, that Cassiopeia might be placed, after her death, among the stars. This circumstance is said to have given occasion to the constellation of that name.

CASSIOPEIA, in Entomology, a name given by Cramer to an African butterfly described by Fabricius under the title of Papilio Aergia. The wings are roundish, of a white colour; anterior pair white, black at the apex, and marked on the lower surface near the tip, with a large brown spot.

CASSIOPEIA, or CASSIOPEIA, in Astronomy, one of the 48 constellations of the northern hemisphere, situate next to Cepheus, not far from the north pole.

In 1572, there appeared a new star in this constellation, which at firstfparkled in magnitude and brightness Jupiter himself; but it diminished by degrees, and at last disappeared, at the end of eighteen months. It alarmed all the astronomers of that age, many of whom wrote dissertations on it; among the rest Tycho Brahe, Kepler, Maurolycus, Lyctor, Gramineus, &c. Beza, the landgrave of Hesse, Rothe, &c. wrote to prove it a comet, and the name which appeared to the Magi, at the birth of Jesus Christ, and that it came to declare his second coming; they were answered on this subject by Tycho. Several astronomers are of opinion that this star has a periodical return, which Keil and others have conjectured to happen every 150 years. Mr. Pigot adopts the same opinion; and he accounts for its not being noticed at the completion of every term by its variable light at different periods, so that it may sometimes increase only to the 5th magnitude: and if this be the case, its period is probably much shorter. Phil. Trans. vol. lxxvi. p. 192.

Dr. Herschell has given a statement of the comparative light of the stars of this constellation in the Phil. Trans. for 1796, vol. lxxvi. p. 463.

The stars in the constellation Cassiopeia, in Ptolemy's Catalogue, are thirteen; in Hevelius's, thirty-seven; in Tycho's, forty-six; but in the British Catalogue, Mr. Flam-

CASSITANEA, in Ancient Geography, a name given by Ptolemy to a country in Egypt, in the vicinity of mount Caris; bounded, on the east, by a part of Judea and Arabia Petraea.—Also iny, a country in Syria, in which Ptolemy has placed 12 towns. This country took its name from mount Cassius in Syria.

CASSITANEA, in Botany, Anith Jaff See Lig-

CASSIR, q. d. Cylis, in Geography, a town of Africa, in the northern part of the rufian province of Algiers, situate among the Beni-Ghaddery, N. of mount Aphronia, and W. of Boujouia or Bouga. Upon the mountains adjacent to this place the Algerians frequently dig up large pipes of lead, supposed to have formerly conveyed the excellent water of these parts to Sable.

CASSIS, in Geography, a town of Africa, in the kingdom of Tunis, near the gulf of Hammet; about 60 miles S.E. of Tunis. This lies upon the ruins of a city, called by the ancients "Civitas Siguerana."

CASSIS, in Military Language, the name of a Castle; which see.

CASSITANIA, in Geography, an Indian town of America, which, as well as the Coweta town, is 60 miles below the Horfe-ford or Chattahooche river.

CASSITERIA, in Natural History, the name of a genus of crystals. The word is derived from κασσιτηρος, tin; and expresses crystals which are influenced in their figures by a mixture of the particles of that metal. These are all pyramidal without columns, and composed only of four sides or planes. Of this genus there are only two known species, the whitish and the brown; found in Devonshire and Cornwall.

CASSITERIDES, in Ancient Geography, an appellation which formerly comprehended Great Britain and Ireland, and which was afterwards restricted to the isles of Scilly, famous, as well as the neighbouring coast of Cornwall, for their tin, which, according to Pliny, (l. xxxiii. c. 16.) was white and the most valuable, and called by the Greeks κασιτηρον. Strabo says (Geog. vol. 1. p. 265. ed. Caesab.) that they were 10 in number, situated near one another and toward the north from the port of the Artabri. One was a desert island; the rest were inhabited by a people wearing black garments, which hung down to their heels and were bound round their breasts. They subsisted on their herds and had no fixed habitations; but they supplied those who traded with them with tin, lead, and fenns, in exchange for which they received earthen vessels, flints, and beads. The Phoenicians, says this geographer, were in ancient times the only persons who carried on this commerce with them, fasting hither from Gades, but concealing their navigation from the rest of the world. The Greeks succeeded the Phenicians, and they were at length followed by the Romans. Cassiterides, in the Greek language, denotes "the islands of tin;" but this name was probably derived from some Phoenician or Celtic term. The Chaldæans and Arabsians used words very fimilar to sstina. Thus in Numh. xxxvii. 22., for the Hebrew יְלָדָה, and Greek κασσιτῆρος, Jonathan has יְלָדָה, and the Jerusalem interpresר יְלָדָה, and the Arabs יְלָדָה, יְלָדָה. and in the Talmudic tract of the Sâbæni, יְלָדָה, יְלָדָה, is to.

From the different modes of expression, we may infer that the term was borrowed from other nations by the Greeks.

E. B. Ch.
Bochart, Georg. Sacr. apud. Oper. vol. i. p. 672. These islands were also denominated "Sorlings," which, in the language of the Britons, signifies "separated from the height of the land;" and it has been inferred, that the term "Casiteride" may be composed of Briton or Celtic words, viz. "Kasiter" signifying "they are almost separated." According to this etymology, the name casiteride succeeded that of "Casiteri;" and it has been inferred that the Phoenicians derived their tin from the islands denominated Sorlings, as well as from the country of Cornwall.

CASSIUS, in Bailmy, Tabern. See CASCUSA.

CASSIUM, in Geography, a town of Africa in the country called Caecilius. Prolem.

CASSIUS, C. JULIUS, in Biography, a celebrated Roman, was the descendant of an ancient and honourable family, zealous for the public liberty, that one of his ancestors, Sp. Cassius, after a triumph and three consulships, is said to have been condemned, and put to death by his own father, for aiming at dominion. C. Cassius himself manifested at an early age his hatred of tyranny; for hearing, when he was a boy at school, Faustus, the son of Sylla, boasting among his school-fellows of his father's greatness and absolute power, he gave him a box on the ear; and he afterwards declared, in the presence of Pompey, who demanded an account of the quarrel, that if Faustus should dare to repeat the words, he would repeat the blow. In the Parthian war he was quartered to Cassius, and signified himself both by his courage and skill, and if Cassius had followed his advice, would have preferred the whole army. After the defeat and death of this leader, B.C. 53, he made good his retreat with the remains of the broken legions into Syria; and when the Parthians who pursued him blocked him up in Antioch, he preferred that city and province from falling into their hands; and, watching his opportunity, gained a considerable victory over them, with the destruction of their general. In the civil war between Caesar and Pompey, he took part with the latter, and commanded his fleet. After the battle of Pharsalia, B.C. 48, he sailed with 70 ships to the coast of Asia, with a view of raising forces, and renewing the war against Caesar; and as soon as he had obtained intelligence where Caesar, who crossed the Nile on a small force, designed to land, he lay in wait for him, in the bay of Cilicia, at the mouth of the river Cydaurus, with a resolution to destroy him; but Caesar landing on the opposite shore before he was aware, and his project being thus baffled, he thought it most prudent, whilst all the people of the country were declaring for him, to make his own peace, by joining the conqueror with his fleet. He fled, however, retained his strong dislike of usurped authority; and when Caesar had been created perpetual dictator, and seemed to aspire after royal honours which every true Roman detested, he formed a conspiracy against his life, and urged his friend and brother-in-law, Brutus, to take a lead in the execution of his purpose. His resolution to destroy Caesar has been ascribed to motives of private difficulty and resentment, and particularly to his being refused the consulship and to Caesar's having conferred on Brutus the more honourable praetorship in preference to him. Hence it has been said, that he hated the tyrant rather than the tyranny, and that in the prosecution of the whole design he manifested a peculiar rancour. But we need not be at a loss for the true motive of his conduct, if we advert to his temper and principles. He was famously inquisitive and violent, impatient of contradiction, and much more of subjection, and passionately fond of glory, virtue, and liberty. From these qualities Caesar apprehended his danger; and when admonished to beware of Antony and Dolabella, he used to say, that it was not the gay, the cursed, and the jovial, whom he had cause to fear; but the thoughtful, the pale, and the lean; meaning Brutus and Cassius. For the progress and termination of this conspiracy; see M. J. BRUTUS and Cæsar. After Caesar's assassination, the conspirators withdrew from Rome. Cassius proceeded to Greece and joined Brutus at Athens. Having raised a considerable body of troops in Lusitania, he marched into Syria, the government of which had been affliged him by Caesar, and having made himself master of the country, he pushed into Phœnicia and Judea, and then laid siege to Laodicea, whither Dolabella, who was endeavouring to take possession of Syria, had been under a necessity of retreating. Cassius, having taken the town, treated it with great severity; plundering its temples, levying oppressive contributions, and putting to the sword many of the chief inhabitants. Whilst he was preparing to invade Egypt, Brutus urged him to oppose Antony and Octavianus, who were preparing to cross over into Macedonia. He joined Brutus at Sidone, and at his recommendation, it was determined that Brutus should reduce the Lycians, whilst he undertook the expedition against the Rhodians. After some unsuccessful engagements on their part, the city of Rhodes was invested by sea and land, and compelled to surrender. Cassius treated the vanquished in the true spirit of a Roman general. Having placed his tribunal in the forum with a spear planted before it, he restrained his soldiers from all plunder or violence; and summonoing go of the principal citizens before him, cauished them immediately to be put to death. Having accumulated from the spoils of the city the sum of 8000 talents, and ordering the commander of the garrison, which he left behind him, to levy from the inhabitants 500 more, he returned to the continent, and proceeded to join Brutus, exacting from all the provinces of Asia, as he pulled, a payment of 10 years' taxes. His junction with Brutus at Sardis was followed by occurrences, of which a brief recital has been given under the article Brutus. On the plains of Philippi the combined army of these two commanders met that of the triumvirs; and in the engagement that ensued, the ardour of Brutus in pursuing the troops of Octavianus left him exposed, and at length obliged him to retire with a small band from the field of battle. Titinius in the mean while was dispatched to gain intelligence; and when Cassius, perceiving from the eminence on which he stood that he was surrounded by a body of cavalry, which he apprehended to be that of the enemy, and not a detachment of friends coming to their relief, as in fact it was, imagined that Titinius was taken prisoner, he reproached himself for exposing a dear friend to such an accident, and withdrew to his tent. He was accompanied by Pindarus, one of his freedmen, who had constantly attended him ever since the battle in which Cassius was slain, for the purpose of performing the last office for him, if occasion should require it. The circumstances of his death have not been ascertained; some say that he dispatched himself with the dagger with which he stabbed Caesar; but the fact was, that his head was found severed from his body, and that Pindarus no more appeared. This event occurred on the birth-day of Cassius, B.C. 42.

Cassius was a prudent and valiant commander, and an ardent lover of his country; and though he was in many respects inferior to Brutus, and charged with avarice and cruelty, he has been honoured as an affiler of the liberties of Rome, when they were just expiring, and he has shared with Brutus in the distinguishing appellation of "sall of the Romans." He was learned himself, and a patron of literature;
Cassius.

literature; several of his letters to Cicero are extant; and that great orator beheld praise on him in various parts of his works. If we compare Cassius with his friend Brutus, the latter was the more amiable friend, and the former the more dangerous enemy. Cassius has been charged with violence and cruelty in his mode of treating money and other necessaries from the cities of Asia. But it has been urged in vindication of his conduct, that he was engaged in an inexpressible war, where he must either conquer or perish with the republic itself, and in the prosecution of which his legions were not only to be supported, but rewarded; the revenues of the empire were exhausted; contributions were scanty; neighbouring states wished to maintain their neutrality. In these difficult circumstances, when money was necessary, and it could only be obtained by force, extortion, it is said, became necessary; the necessity of the end justified the means; and when the safety of the empire, and the liberty of Rome were at stake, it was no time to hie to fumptures. This was Cassius's mode of reasoning, and the ground on which he acted; whilst he applied all his thoughts to the support of the cause which he had undertaken. Brutus, on the other hand, being of a temper more mild and sentimental, contented himself generally with the regular methods of raising money; and from his love of philosophy and the polite studies, he had contracted an affection for the cities of Greece, instead of levying contributions, used to divert himself, whereto he pallied, with feating their games and exercises, and preluding at their philosophical disputations, as if travelling rather for curiosity than to provide materials for a bloody war. When he and Cassius therefore met, the difference of their circumstances showed the different effects of their conduct. Cassius, without receiving a penny from Rome, came rich and amply furnished with all the stores of war. Brutus, who had received large remittances from Italy, came empty and poor, and unable to support himself without the help of Cassius, who was obliged to give him a third part of that treasure, which he had been collecting with so much envy to himself for the common service. In his latter years Cassius defected the Stoics, and became a convert to Epicurus, whose doctrine he thought more natural and more reasonable; constantly maintaining, that the pleasure, which their master recommended, was to be found only in the habitual practice of justice and virtue. Whilft he professed himself therefore an Epicurean, he lived like a Stoic; being moderate in pleasures, temperate in diet, and through life a water-drinker. In the letters addressed to him by Cicero, though he raises his Epicurism, and change of principles, yet he allows him to have always acted with the greatest honour and integrity; and piously says, "that he should begin to think that feat to have more nerves, than he imagined, since Cassius had embraced it." Plutarch, Vit. Brutus and Cato, T. i. p. 984. Middleton's Life of Cicero, vol. ii. Anec. Un. Hist. vol. x. & xi.

Cassius, Aurelius, an eminent military commander in the reign of Marcus Aurelius and an usurper of the empire, was, according to Dion Cassius, a native of Syria, and a son of Heliodorus, the rhetorician; but the author of his life, Vulpianus Gallicanus, seems to make him the son of Avidius Severus, who was raised from the rank of a centurion to the highest dignities of the state, and as a man of merit, much regarded by Aurelius. The same writer represents him as by his mother's side a descendent from the ancient Roman Cassii. Crevier disputes that genealogy, though, as he says, he polished all their haughty airs, infamies, and antipathy against monarchal government; adding to these qualities great skill in the art of war, and that he commanded the fear and gladness of the soldiers. The full account we have of him is that of his commanding an army against the Parthians under the emperor Verus, about the year 164, whom he entirely defeated near Nisibis, a city of Syria. Imposing this victory over Vologeses II. king of the Parthians, he passed the Euphrates, took Ctesiphon, and subdued the royal palace. He likewise subdued Edessa, Babylon, and al Media; and though Seleucia on the Tigris opened its gates to him, he ordered the inhabitants, amounting in number to 40,000, to be unmercifully massacred, and the city to be utterly destroyed. On his return he held great numbers of his foes by famine and death; however, he put an end to the war, and obtained for the indolent Verus, who had never joined him at Antioch, the title of conqueror of the Parthians and Median. Cassius, having acquired the reputation of a rapid disciplinarian, was invited by Aurelius with the command of the legions of Syria; nor did he disappoint the hopes which the emperor had conceived of him. Whilft he had this command, he marched against the Egyptians, who had revolted, and contrived to subdue them by policy rather than force, and he afterwards performed great exploits in Armenia and Arabia. In the war against the Sarmatian Jazagars, he punished with an ignominious death some centurions who had crossed the Danube without orders, though they had killed 3000 of them and returned to the camp with very considerable booty. This severity occasioned a mutiny in the army; but Cassius, with invincible intrepidity, appeared unarmed in the midst of the mounted multitudes, called out aloud to them, "kill me; and to your neglect of duty, add the murder of your general!" and by this intrepid valor, he quelled their fury and recalled them to their duty. Whilst he inspired his soldiers with awe, he likewise engaged their attachment; and though, among the inequitable accounts that occurred of his character, he is generally represented as chargeable with atrocious vices, infidnuch that he has been denominated a second Catiline, he seems to have possessed the qualities necessary for constituting a great commander. When he commanded in the Parthian war, Verus suspected his ambitious designs, and communicated his apprehensions to M. Aurelius, his partner in the empire. But the philosophical emperor took no notice of the charge that was alleged against him; but continued to entrust him with the command of the army in the East. In the 15th year of Aurelius's reign, A. D. 175, Cassius threw off all disguise, and ventured to declare himself his rival in the empire. With this view he availed himself of an illness, under which Aurelius laboured during his war against the Marcomanni, to circulate a report of his death, and to cause himself to be proclaimed emperor in his room. Having assumed this title, he soon reduced all the countries beyond mount Taurus, and the governor of Egypt declared in his favour; several foreign princes and nations respected his name, and many with greater zeal than the Jews. Whilft he was successfully pursuing these measures for the establishment of his power, he ignominiously respected for the memory of Aurelius, and placed him among the gods. As soon as the news of this revolt reached Rome, the senate instantly declared Cassius a traitor, and confiscate his effects; but the emperor, with singular moderation, left Germany and pursued his march as far as Illyricum towards the east; proposing to reign the empire to his competitor, if the gods should judge it expedient for the public good, that Cassius should reign, and not Marcus Aurelius. He had not proceeded far before he received the news, that Cassius had been killed in consequence of a conspiracy among his inferior officers. When the head of Cassius was brought to the emperor, he expressed
CASSUMUNAR, in Ancient Geography, a fountain of Greece, in the Phocide, and in the vicinity of Delphos. Panhens.

CASSOVA, in Geography. See CASSON.  

CASSONADE, in Commerce, cafe sugar, or sugar put into cakes or waffles, after the first purification, but which has not been refined. It is sold, either in powder or in lumps; the white, and that of which the lumps are largest, is the best. Many imagine it to sweeten more than loaf sugar; but it is certain that it yields a great deal more. See SUGAR.

CASSOPO, in Geography, a town of the island of Corfu, 8 miles N. of Corfu.

CASSOTIS, in Ancient Geography, a fountain of Greece, in the Phocide, and in the vicinity of Delphos. Panhens.

CASSUTHA. in Botany, Rumph. See CASSYTA.  

CASSUVIUM, Rumph. Lam. Juft. See ANACARDIUM.


Gen. Ch. Cal. perianth three-leafed, very small, permanent; leaves semi-oval, acute, concave, erect. Cor. petals three, roundish, acute, concave, permanent; nectary of three glands, oblong, truncate, coloured, the length of the germ, and flanding round it. Stam. filaments nine, erect, compressed; glands two, globular, seated on the side of the bafe of each of the three interior filaments; anthers adnate to the filaments below their tip. Pfl. germ egg-shaped, within the corolla and calyx; style rather thick, the length of the flaments; figg. slightly trifid, obtuse. Peric. receptacle incrusted into a deformed globular drupe, crowned with the converging calyx and corolla, perforated with a navel. Seed, nut globular, acuminate, with the converging flaments. Linn. Schreb. and Mart.  

Cal. one-leafed, permanent; segments fix, ovate-acute, straight, concave; three interior ones resembling petals. Cor. none. Stam. nine, in several ranks; filaments compressed; anthers fixed below their tips; accompanied by nine yellowish, glandular bodies; six of which are fixed to the bafe of the three interior flaments, one on each side; the three others alternate with those flaments, oblong, truncate. Pfl. germ superior, ovate; style thick, fligma obtuse, slightly trifid. Lam. and Boic.

Cal. one-leafed, globular, stellated at the border, fix-cleft, converging; the inner alternate, segments (petals, Linn.) a little larger; bracts at the bafe (calyx, Linn.) three, very small. Cor. none. Stam. filaments twelve, inserted in a double order into the top of the calyx; the fix exterior ones fertile, naked at the bafe, opposite to the segments of the calyx; the fix interior ones opposite to the former; three fertile, with two glands at the bafe of each; three alternate with them, barren (nectary, Linn.), resemblling tubercles; anthers adnate to the anterior side of the fertile flaments, two-celled (two-valved from the bafe to the tip). Pfl. germ superior; style thickish; fligma obtuse (slightly trifid?). Peric. capsule globular, one-seeded; covered by the converging, somewhat-berried, calyx. Juff.
CASSIA papyrifera, Hort. Kew. See Rhipsalis.

CAST, a term in Scripture, for the impression of any figure taken in bronze, plaster, wax, or other oblong material. The original of this word is כָּשׁ, tash, because the filled matter is thrown on the figure of which the impression is to be taken. The process is as follows: plaster of Paris is mixed with water in a basin or pan, and poured with a ladle until its consistency is like that of better for pan-cakes; it is then poured on any figure, for instance, an human hand, or foot, previously heated or oiled in the flightman manner possible, which will prevent the adhesion of the plaster; after a few minutes the plaster will dry to the hardness of solid bone, taking the exact impression of every part, even the minutest pores of the skin. This impression, the reverse or hollow of the original subject (like a leaf in comparison with its impression), is called the mould, which being taken off from the figure that produced it, must be lightly greased, and then plaster, mixed with water as before, may be poured into this first impression or mould, and remaining until it is hardened, and then relieved, or taken from the mould, is the exact image of the original figure. If the figure is flat, having no deep hollows or high projections, it may be moulded in one piece; if its surface is varied with great hollows and projections, it must be moulded in many pieces, fitted together, and held in one or more outside or containing pieces. Pllow mentions casting faces from nature in the early practice of Greek sculpture. This useful art supplies the painter and sculptor with exact representations from nature of limbs, bodies, heads of men and inferior animals, anatomical subjects, draperies, and plants; it multiplies models of all kinds, and is now practiced in such perfection, that casts of the antique statues are made so precisely like the originals in proportion, outline, and surface, that no difference whatever is discoverable, excepting in colour and materials. See BRONZE and BRONZE CASTING.

CAST, among Wax Chandlers, denotes a half-cell of melted wax, poured on the wicks of candles made by the laie.

CAST, among Founders, is applied to tubes of wax, fitted in divers parts of a mould of the same matter, by means of which, when the wax of the mould is removed, the mellow metal is conveyed into all the parts which the wax before possessed.

CAST, among Bowlers. See BOWLING.

CAST also denotes a cylindrical piece of brass, or copper, fitted in two, lengthwise, in the founders in found to form a canal or conduit in their moulds, whereby the metal may be conveyed to the different pieces intended to be cast from the same mould.

CAST, among Plambers, denotes a little brass funnel, at one end of a mould, for carrying pipes without folding, by means of which the metal melted is poured into the mould.

CAST of the country, with Miners, the colour of the earth.

CAST, in Falconry, denotes a set or couple of hawks.

To cast a hawk to the perch, signifies to set her upon it.

CAST, in Rural Economy, a term applied to these kinds of insects. Thus a call of bees signifies a swarm or flight of bees. See BEEs.—Also, a word sometimes applied to poultry, when they lose their feathers, or molt. It is also applied to the changing of the hair: and hоofs of horses. Horses call or shed their hair at least once in a year. Every spring they call the winter coat, and take a summer one; and sometimes in the end of autumn they put on their winter hair, in cafe they have been ill fed, farriied, or clothed, or kept in a cold stable. Sometimes they call likewise their hoofs; when this happens, they should be turned out into a pasture for some length of time.
C A S

Case, among the Hindoos, denotes a tribe; or number of families of the same rank and profession; and this division, which is ancient and peculiar, has variously been preserved in India. This distinction seems to have proceeded, from a craftsman, particular to order his own insufficiency or predominance. Prior, 1854, Dr. Robertson, in his India, concerning India, p. 157.) to the Hindus of authentic history, and even from the very remotest era, to which their own traditions pretend to reach. This separation of profession has not only taken place among the natives of India, but the perpetuity of it was secured by an institution which must be considered as the fundamental articles in the system of their policy. The whole body of the people was divided into four orders or castes. According to all the writers of antiquity, indeed, the Hindoos are said to be divided into seven tribes or castes. See Strabo, l. xiv. p. 1039. Diod. Sicul. lib. ii. p. 173. Arius, Ind. c. 17. But they were probably led into this error by confounding some of the subdivisions of the castes, as if they had been a distinct independent order. However, from the concurrent testimony of the best informed modern travellers, we learn, that there were no more than four original castes. In a work entitled, "La Porte Ouverte, ou la Vraie Representation de la Vie, des Moeurs, de la Religion, et du Service des Brahmines, qui demeurent fur les Colles de Choromandel, &c." compiled before the middle of the 17th century, by Abraham Roger, chaplain of the Dutch factory at Pulicat, we have a distinct account of these castes. No doubt can now be entertained with respect either to the number or the functions of the castes, as both are ascertained from the most ancient and sacred books of the Hindoos, and confirmed by the accounts of their own institutions, given by Brahmins of note for their learning. According to them, the different castes proceeded from Brahma, the immediate servant of the creation under the Supreme Power, in such a manner as to establish both the rank which they were to hold, and the office which they were required to perform; so that to mingle or confound them would be deemed an act of the most daring impiety.

The members of the first caste, called the brahmins, from the mouth (widow), and deemed the most sacred, had it for their province, to pray, to read; to instruct, to study the principles of religion, to perform its functions, and to cultivate the sciences. They were the priests, the instructors, and philosophers of the nation. The members of the second order, called Chederees, from the arms (strength); to draw the bow, to fight, to govern; were entrusted with the government and defence of the state. In peace they were its rulers and magistrates; in war they were the generals who commanded its armies, and the soldiers who fought its battles. The third order, called the Diis, from the belly and thighs (nourishment); to provide the necessaries of life by agriculture and traffic; was composed of husbandmen and merchants. The fourth castes denominated the Squder from the feet (subjection); to labour, to serve; composed of artisans, labourers, and servants. Subordinate to these castes is a fifth, or adventitious class, denominated Boursah Sunder, supposed to be the offspring of an illicit union between persons of different castes. These are mostly dealers in petty articles of retail trade. (See preface to the code of Gentoo laws, p. 156 and 500.) This adventitious cast is not mentioned, as Dr. Robertson supposes, by any European author. The distinction was too fine to be observed by them, and they seem to confound the members of this cast as belonging to the Squder. Besides these acknowledged castes, there is a race of unhappy men, denominated on the Coromandel coast Pariaus, and, in other parts of India, Chandals. These are outcasts from their original order, who, by their misconduct, have forfeited all the privileges of it. Their condition is, without doubt, the lowest degradation of human nature. If a Paria approach a N郭r. i.e. a warrior of high cast, on the Mahabarata, he may put him to death with impunity. Water and milk are considered as defiled even by their shadow passing over them, and cannot be used until they are purified. (Areya Akbery, vol. iii. p. 244.) Every Hindoo who violates the rules or institutions of his cast fixes into this degraded situation. Hence it is that the Hindoos do religiously adhere to the institutions of their tribe, because the loss of caste is, to them, the loss of all human comfort and respectability; and is a punishment, beyond comparison, more severe than excommunication in the most triumphant period of Papal power.

The four original castes are named, and their functions described in the "Mahabarat," the most ancient book of the Hindoos, and of higher authority than any with which Europeans are hitherto acquainted. Baghvat Greta, p. 150. The same distinction of castes was known to the author of Hecto-pades, another work of considerable antiquity translated from the Sanscrit, p. 257.

The members of one cast can never quit his own, or be admitted into another; so that the imitation of every individual is utterly fixed, his destiny is irremovable, and the walk of life is marked out, from which he must never deviate. Moreover, the members of each cast adhere in general to the profession of their forefathers; and from generation to generation, the same families have followed, and will always continue to follow, one uniform line of life. However, though the line of separation be so drawn as to render the ascent from an inferior to a higher cast absolutely impossible, and it would be regarded as a most enormous impiety if one in a lower order should presume to perform any function belonging to those of a superior cast; yet, in certain cafes, the Pundits declare it to be lawful for persons of a high cast to exercise some of the occupations allotted to a cast below their own, without losing their cast by doing so. Pref. of Pundits to the Code of Gentoo Laws, p. 106. Accordingly we find Brahmins employed in the service of their princes, not only as ministers of state (Orme's Fragments, p. 257), but in subordinate stations. Many officers of the army, particularly in the Mahatta states, have been Brahmins; and many sepoys in the service of the East India company, especially in the Bengal presidency, are of the Brahmin cast. Another fact concerning the castes deserves notice. An immense number of pilgrims, amounting in some years, to more than 150,000, visit the pagoda of Juggernaut in Onda, one of the most ancient and revered places of Hindoo worship, at the time of the annual festival in honour of the deity to whom the temple is consecrated. The members of all the four castes are allowed promiscuously to approach the altar of the idol, and fear themselves without distinction, eel indiscriminately of the same food. This seems to indicate some remembrance of astate prior to the institution of castes, when all men were considered as equal.

Such arbitrary arrangements of the various members, composing a community, seem, at first view, to be adverse to improvement either in science or arts, and the artificial barriers that separate different orders of men tend to circumscribe the operations of the human mind within a narrower sphere than nature has allotted to them. Hence genius must sometimes be checked in its career, and talents fitted to shine in an higher sphere be confined to the functions of an inferior cast. Nevertheless, these arrangements of Indian policy are adapted to the general state of society, though they may be attended with partial inconvenience; and they serve to accomplish the object of the first Indian legislators, which was
was to employ the most effectual means of providing for the sufficiency, the security, and the happiness of all the members of the community over which they presided. With this view they set apart certain races of men for each of the various professions and arts necessary in a well-ordered society, and appointed the exercise of them to be transmitted from father to son in inheritance. This fudong, though repugnant to the ideas which we, who are placed in a very different state of society, may have formed, and better adapted to the attainment of the end proposed, than a careless observer is apt to imagine. An Indian, on his entrance into life, knows the station which he is destined to occupy, and the functions which he is to perform; and from his earliest years, he is trained to the habit of doing, with ease and pleasure, that which he must continue to do through life. To this may be ascribed that high degree of perfection conspicuous in many of the Indian manufactures; and though reverence for the practices of their ancestors may check the spirit of invention, yet, by adhering to these, they acquire such an expertise and delicacy of hand, that Europeans, with all the advantages of superior science, and the aid of more complete instruments, have never been able to equal the exquisite execution of their workmanship. To this early division of the people into castes, we must likewise ascribe a striking peculiarity in the state of India; the permanence of its institutions, and the immutability in the manners of its inhabitants. What now is in India, says Dr. Robertson, always was there; and is likely still to continue; neither the ferocious violence and illiberal fanaticism of its Mahometan conquerors, nor the power of its European masters, have effected any considerable alteration. The same distinctions take place, the same arrangements in civil and domestic society remain, the same maxims of religion are held in veneration, and the same sciences and arts are cultivated; and hence, in all ages, the trade in India has been the same. This ingenuous writer adduces the division into castes as one evidence of the ancient and high civilization of the Hindoos. But it has been observed by Mr. Pinkerton (see Mod. Geog. vol. ii. p. 259) that the error of his argument consists in his confounding castes with trades, while in reality they are totally distinct, as neither a priest, a soldier, a farmer, nor a labourer is a tradesman. Separation of trades argues refinement; but from the Hindoo caste nothing can be concluded, except that agriculture existed at their institution. Besides, when he adds that "what now is in India, always was there," he evinces rather a singular love of hypothesis. All we know from antiquity is, that the castes existed in the time of Strabo, Arrian, and Pliny, and perhaps were not known even in the time of Alexander. If we suppose that they existed three centuries before the Christian era, we have only a proof that agriculture and merchandise were then known in Hindoostan; and yet the first tribe that passed from the centre of Asia might, even in that state, have only begun to people the north of Hindoostan a few centuries, or a thousand years before the Christian era. Among the followers of Boudha or Buon, in the Birmian empire, and in Siam, the distinction of castes is utterly unknown. Dr. Buchanan (Aristot. References, vol. vi. p. 253.) in tracing the origin of the doctrine of castes established in Hindoostan, refers to Pliny, (N. H. i. x. c. 179) who mentions a division of ranks among various Indian nations, which he calls "vita multipartita," but from what he says, it does not appear to have been universal at the time he received his intelligence; neither is it by any means clear, that his "vita multipartita" means caste. It is to be observed, that all Roman citizens, followed nearly the same mode of life; they were soldiers and statesmen; and when not employed in either of these capacities, they were all cultivators of the land. To them, therefore, a distinction of professions among the citizens of a state would appear strange; and hence this writer inclines to think, that the "vita multipartita" of Pliny more resembles the division of ranks and professions among the Barzani, or in modern Europe, than it does the castes of the Brahmins. The description of Pliny, in the passage above referred to, neither agrees with the present divisions of the different castes, nor does it call the learned Brahmins; on the contrary, Pliny speaks of the Brahminas not as a class, and order in society, but as a nation, and as a name common to many nations. He mentions, that Seneca had attempted to procure the names of all the people inhabiting India, and had actually heard of 118 nations. The most considerable of these he afterwards enumerates, lib. vi. c. 17. See Birmian Empire, Boudh, Brahmins, and Hindoos.

CASTAWAY, in Sea Language, the state of a ship which is lost or wrecked on a lee shore, bank, or shallow.

CASTABALA, in Ancient Geography, a town of Asia, in Cidia Propria, according to Ptolemy, who places it in the neighbourhood of Mopseulia. In the Itinerary of Antonine it is in the route from Constantinople to Antioch. M. d'Aulville places it at a very small distance to the north-west of Ilius. - Alto, a town of Asia Minor, in Cappadocia, placed by Strabo near the mountains, which fays that it had a temple of Diana Peraasia. M. d'Aulville places it at the source of a river which discharged itself into the Euphrates. It was at some distance E. of Cibyrha.

CASTABUENA, in Geography, a town of Iliria; six miles S. of Capo d'Iliira.

CASTACIUS SIVUS, or Ancient Geography, a gulf of Asia Minor, on the Thracian Bosporus, S. of the gulf Cylindrium.

CASTAGNEUX, in Ornithology, a name given to a species of Columb us, which fec.

CASTAGNO, ANDREA, DAL, in Biography, an eminent historical painter, was born at a small village called Castiglione, belonging to Tuscany, in 1469, and being deprived of his parents when young, was employed by his uncle to attend the herds of cattle in the fields. His singular talents, which were fully manifested in surprising efforts to imitate an ordinary painter, whom he accidentally observed at work, became the common topic of discourse in Florence, and excited the curiosity of Bernardetto de Medicis, so that he placed him under the tuition of the best masters at that time in Florence. Andrea, affidiously improving his advantages, became particularly eminent in design, and found full employment. At first he painted only in tempera and fresco; but at length he learned the secret of painting in oil from Domenico Venetiano, who had derived his knowledge of it from Antonella da Meffina. He was the first of the Floreniite artists who painted in oil; but enjoying the merit of Domenico, from whom he obtained the secret, he determined, with the greatest ingratitude, to affix his own name and benefactor. At this time Domenico and Andrea lived together, and were partners in buffets. Incautiously, however, of every obligation, and combining treachery with ingratitude, he way laid Domenico in the corner of a street, and killed him with such ferocity, that he escaped unobserved and unsuspected to his own house, where he sat down with apparent composure to work; soon after Domenico was conveyed thither to die in the arms of his assassins. The real author of this atrocious act was never discovered, till Andrea, through remorse of conscience, disclosed it on his death-bed, in 1480. Andrea finished several considerable works at Florence, by which he gained great wealth.
C A S

wealth and a pertaining; but as soon as his complicated villany became public, his memory was afterwards held in the utmost detestation. The most noted of his works is in the ball of justice at Florence, and represents the execution of the conspirators against the house of Medici. Pilkington.

CASTAGNOLA, in Geography, a town of Piedmont, on the Po; 8 miles S. of Turin.

CASTAGNOLLE, in Italy, a name given by the Italians to the fish called by the generality of authors Acipenser, while for Acipenser in Scotland.

CASTALDI, Cornetli, in Biograph, the descendant of a noble family, was born at Feti about the year 1730, and though educated to the bar, he devoted himself to poetry and the study of polite literature. On his marriage he settled at Padua, where he founded a college, and gained universal esteem. He died in 1756. His poems were both Italian and Latin. The former contain ingenious and elevated sentiments, but are defective in sweetness and elegance of style. The latter are a happy imitation of the ancients. They were published at Venice, in 4to. in 1737, by the abbe Canti, with a life of the author prefixed by Signor Fafetti. Nouv. Dict. Hift.

CASTALDUS.

CASTALDY.


Gen. Chi. Cal. perianth four or five-leaved, surrounding the margin of the receptacle. Cor. petals from twenty to thirty, inserted into the pericarp from the base to the middle. Stema. filaments from fifty to a hundred and fifty, inserted into the pericarp above the petals, free. Pd. 5. Astyle none. iligma with as many rays as there are cells in the fruit. Peris. from twelve to twenty-celled, patryfying as the seeds ripen. Nett. one, in the centre of the iligma, globular. Seeds from two to three hundred, fiddle on the inner side of the pericarp, surrounded with a folicle.

Flowers white, red, or blue, rivalling the magnolias. It differs from the proper nymphaea in the insertion of the petals and ilamens into the pericarp, and not into the receptacle. We have adopted Mr. Salisbury’s generic name, from a confirmed unwillingness to change any name once given, unless urged by the most cogent reasons; but, at the same time, we feel ourselves constrained to add, that we cannot concur with that excellent botanist in the principle on which he has been induced to choose it. Every attempt to extend the sexual analogy between plants and animals to the mode of operation and its essential circumstances, appears to us to be no less adverse to philosophical precision and truth, than it is unfairly to moral purity, and to that delicacy of decorum, which is one of the best characters of a rightly cultivated mind.

* Leaves with a fissure extending to the petiole.

Sp. 1. C. odora. (C. pudica, Salis. Nymphaea odorata, Hort Kew, Bat. Rep. pl. 207. “ Lobes of the leaves divided, acuminate; receptacle fiddle-shaped like the nave of a wheel.”) Medulliformis, Salis. to the word is spelt both in the Annals of Botany, and in Paradisif Lundelius, but as we are not acquainted with such a Latin word, we presume it should be modified, which means either a small conical measure, or the nave of a wheel.” A native of Virginia. The flowers diffuse a spicy odour, somewhat resembling aniseed. 2. C. alba, white water-lily. (C. fiscoe, Salis. Nymphaea alba, Linn. Eng. Bot. pl. 160.) “ Lobes of the leaves approximate, fearcely acuminate; receptacle cymbal-shaped.” Caltha-leaves four, oblong, green underneath, white above, often tinged at the base with a light bluish-colour. Petals white, lanceolate, in several rows, gradually diminishing in size. Stamens yellow; outer ones dilated, resembling petals, with only the rudiments of an anther. Fruit scarred with the marks of the foliaceous petals and ilamens. A native of various parts of Great Britain; in ponds and slow streams.

** Leaves pedate.


CASTALIA, in Entomology, a species of Phalaena, (Bombyx), found in New Holland.
CASTALIA, or CASTELLO, Sebastian, whose proper name was Castellion, in Biography, was born in 1515, in the mountains in the district of Dauphine, or, as some say, of Savoy. Although nothing certain is known concerning his education, he appears to have obtained the elocution of Calvin, by his acquaintance with the ancient language; and then he was introduced to that reformer at Strasbourg, in 1540 and 1541. On his recommendation he was appointed teacher in the college of Geneva; but the intolerant temper of Calvin obliged him to leave this situation, after having occupied it about three years. He disagreed with Calvin with regard to the doctrine of predetermination; he disapproved of the civil punishment of heretics; he considered the Canticles of Solomon as a profane piece; he entertained an opinion peculiar to himself concerning Christ's descent into hell; and he was suspected of having imbued some of the sentiments of the Anabaptists. Such were the offences for which he was expelled Geneva, and became an object of the persecution both of Calvin and Beza. At Basle, whether he removed, he obtained the professorship of the Greek language; but having a large family, and his circumstances being indigent, he found it very difficult to procure for them a subsistence, and to prosecute the studies to which he was devoted. Calvin, who could not be ignorant of his disaffected situation, but who seems to have felt no compassion for him, accused him of stealing wool. Calilay's own relation of the facts is as follows: "Being totally occupied with my translation of the Scripture, and resolved rather to beg than to quit it, as I dwelt on the banks of the Rhine, I employed myself at leisure hours in catching with a hook the floating wood, which was brought down by the stream by its inundations, that I might warm my family. This wood is public property, and belongs to him that first takes it." He appeals to the whole city of Basle for the truth of his narration, and concludes with thus addressing the unsympathizing Calvin: "I could not have thought that you, who knew me, could have credited such a charge; but that you should publish it to the whole world, and transmit it to posterity, is what (although I know you) I could not easily have believed!" The contumacy at Basle would not allow him to publish his works in that city without animadversion; he was cited before them; and the curators of the university wished to restrain him from theological topics. But whilst his opinions met with no indulgence, he was too much esteemed for his poetry and learning, that his enemies were not able to expel him. However he peaceably closed his life of anxiety and indignation at Basle, in 1543, at the early age of 48 years. Calvin was an elegant, though not a profound scholar; and his Latinity resembles that of the modern Italian schools. In 1545 he printed at Basle four books of Scripture-histories in elegant Latin, with a view of communicating to children a knowledge of the facts of their religion, and at the same time of giving them a taste for polite literature. In 1546 he published a poetical translation of the Sibylline Veres, with notes, together with a prose version of the books of Moses, which was followed by a translation of David's Psalms, and the other Scripture songs. In 1548 he published a Greek poem on John the Baptist, and a Latin poetical paraphrase of the prophet Jonah. He likewise translated some parts of Homer, some books of Xenophon, and St. Cyril. His translation of some Italian treatises of Otho, and particularly his "Thirty Dialogues," favouring polygamy, furnished one ground of the accusations against him. But his greatest work was his Latin translation of the Bible, for an account of which see Latin Bibles. This version was the most elegant and classical that was ever made; but whilst it has been highly commended by some, it has been censured by others for an affected use of terms, not properly belonging to Jewish or Christian theology, and for an improper and paraphrastical deviation from the original phraseology. His "New Testament," however, is read with pleasure, and very properly put into the hands of young scholars. It is no improbable conjecture, that the holiness of Beza against him might have been partly owing to the rivalry of his version. Castalia's French translation of the Bible (see French Bibles), dedicated to Henry II. of France, and printed at Basle in 1555, has been charged with the adoption of a low and vulgar phraseology. Bayle in Gen. Dict.

CASTALOGNE, or CASTELOGNE, a covert made of fine wool, on the weaver's loom.

CASTAMENA, or KASTAMONI, in Geography, a town of Asiatic Turkey, in the province of Notokia, formerly a large and flourishing city, and the see of a Greek archbishop, but now much reduced in size and magnificence: 240 miles east of Confiantinople. N. lat. 44° 42'. E. long. 34° 22'.


CASTANEA equina, Ray. See Aesculus Hippo-castanum.

CASTANEA, in Entomology, a species of Chemere, which see.

CASTANEA, in Natural History, a species of Turbo, and also of Helix, which see respectively.

CASTANET, in Geography, a town of France, in the department of the Upper Garonne, and chief place of a canton in the district of Tolones, 2 leagues S.S.E. of Tolones. The place contains 1520, and the canton 6339, inhabitants; the territory includes 1074 kilometres and 16 communes.

CASTANETTS, CASTAGNETTES, or CASTANETTAS, small musical instruments of percussion, in pairs, each of which the Moors, Spaniards, and Bohemians mark the measures and steps in their dances, holding two in each hand. They consist of two little round pieces of dried wood, and hollowed in the manner of spoons, of which the concavities are placed over each other, fastened to the thumb, and beat from time to time with the middle finger, to mark the steps and gestures.

5 F. Each
Each caftanet is kept in its place by a string passing through a hole pierced through an eminence left for that purpose at the side of the caftanet, and which serves as a neck. There is a notation for caftanets to mark the time, and the two hands ought at least to have as many characters as there are notes in a bar. Dextrous performers will double and triple the notes affixed them.

The tablature for the caftanets is marked with the usual characters of the time-table, placed above and below the same staff or line; those above for the left hand, and those below for the right. The bars, whether a single line or a five line staff, are to be marked by a perpendicular line. There ought likewise to be a clef, and a character for time at the beginning of each tune.

This article is taken from the new *Encykl. Meth.*; but we are unable to discover the use of clefs for a monotonous instrument, or rather for an instrument on which no tuneable sound can be produced.

CASTANETTO, in Geography, a town of the island of Corsica; 13 miles N.E. of Corte.

CASTANHEIRA, a town of Portugal, in the province of Beira; 24 leagues E. of Aveiro.

CASTANIA, in *Ancient Geography*, a town of Italy, near Tarentum; supposed to be that which is now called Castel-laneta.

CASTANVITZ, in Geography, a town of Croatia, seated on the river Unna, and subject to the house of Austria. N. lat. 45° 42'. E. long. 17° 20'.

CASTAX, in *Ancient Geography*, a town of Spain, mentioned by Appian, and supposed to be the fame with the Caftalen of Livy.

CASTEL, Louis Bertrand, in Biography, a geometrical and philosopher, born at Montpellier in 1688, and who entered into the society of Jesus in 1703. He made himself known to Fontenelle and to father Tournemine by his essays and sketches of new invention, which promised the greatest successes. The young man was at this time in Provence, but was invited to the capital. Caftel removed from Thoulouze to Paris in 1720. He supported the idea of his talents which his essays had excited. The first work he published was his "Treatise on Universal Geography," in 2 vols. 12mo. 1724. All nature, according to him, depends on two principles, the weight of bodies and their tendency to motion; the one, which incessantly precipitates them to repose, the other, which re-establishes their motion. This doctrine, the key of the system of the universe, as he pretended, did not satisfy the abbé de Saint-Pierre. Though a friend of the mathematician, he attacked him; the Jesuit answered. The writings on both sides manifested a considerable portion of wit and ingenuity in the combatants, but it was of a singular kind. The second work of father Caftel was his "Plan for an Abridgment of the Mathematics," Paris, 1727, in 4to. which was soon followed by a "Universal Mathematics," 1728, 4to. This work was applauded both in England and France, and the Royal Society of London opened its doors to the author. Diet. Histo.

His "Clavecin Oculaire," or ocular harpsichord, though silent, made a considerable noise in the world, and excited much curiosity and considerable expectation among opticians as well as musicians. His idea of producing the same pleasure to the eye by the melody and harmony of colours, as the ear received from the succession and combination of musical tones, was published in 1725. Sir Isaac Newton, having discovered (Optics, book 1. p. 2. prop. 3.) that the brightness of the seven primary colours in the sun's image, produced, by the refraction of his rays through a prism, are proportional to the seven differences of the lengths of the eight musical strings, D, E, F, G, A, B, C, D, when the intervals of their sounds are T, H, t, i, T, T, t, h; which order is remarkably regular. Smith's Harmonics. From this analogy, Père Caftel sets off by telling us that there is a fundamental and primitive found in nature to which we may give the name of red, or C.

There is also a primitive and original tone which serves for base and fundamental to all colours, which is blue.

There are three essential tones which depend on this primitive tone of C, and which together compose the perfect, primitive, and original chord, which is CEG.

There are likewise three original colours dependent on the blue; they are compounded of no other colours, and they produce the red; these three colours are blue, yellow, and red. The blue is the key-note, the red the fifth, and the yellow the third. There are five tunes, C, D, E, G, A; and two semi-tones, F and C. In the same manner there are five principal colours, blue, green, yellow, red, and violet; and two semi-tone colours, which are orange and indigo.

The musical scales, c, d, e, f, g, a, b. The scale of colours is blue, green, yellow, orange, red, and violet. These are the data of father Caftel, upon which he has founded his organ or harpsichord of colours.

It would be useless to analyze and critically examine his plan, which is truly visionary, false in its ratios, and incapable of producing the promised effects.

After being tried in all parts of Europe, particularly in London, about the year 1756, when the plan and pretended effects were published in an English pamphlet—but its exhibition was soon neglected and forgotten, and has been fearedly heard of since:—he died in 1767, leaving behind him the character of a visionary projector, whose eccentricities, though wild, were innocent; and if he did not inculcude mankind, he contributed to their idle amusements.

Père Caftel was the dupe of a fertile and lively imagination. His systems were at first mere hypotheses; but he cherished them so long, that, by degrees, he fancied he had realized them. "The New General System of Nature," by Newton, in 1743, in 4to. did him more honour, but it diffipated others. He respected the English philosopher, without allowing his doctrine to be the true fyltem of the world. "Newton and DeCartes," says he, "have infinite merit for their invention. The latter had more facility and elevation, the former less faculty and more depth; which is nearly the character of the two nations; the French build loftly, the English profoundly. Both were ambitious of framing a world, as Alexander was of conquering it; and both saw nature on a large scale." Caftel wrote much in the "Memoirs de Trevoux;" he treated an infinite number of subjects, but none deeply. However, "he thought (says his biographer,) a great deal, and often well."

CASTEL, in Geography, a town of Germany, in the duchy of Carniola; 15 miles S.S.W. of Gottschec. — Alfo, a town of Germany, in the circle of Bavaria, and Upper Palatinate; 10 miles S.W. of Amberg.

CASTEL de las Guardas, a town of Spain, in the province of Andalusia; 8 leagues from Seville.

CASTEL Belforte, a town of Germany, in the country of Tyrol; 11 miles N.N.W. of Trent.

CASTEL-Branco, a town of Portugal, in the province of Beira; encompassed by a double wall, flanked with seven towers, and defended by an old castle; containing two churches, two hospitals, a poor-house, two convents, and
CASTELL, Edmund, in Biography, a learned divine, was born in 1605 at Hatley, in the county of Cambridge, and educated at Emanuel college in the university of Cambridge, whence, after a residence of many years, he removed to St. John's college for the benefit of its library. The great work which engaged his chief attention for 17 years, and as he says, cost him almost the incredible sum of £2000, was his “Lexicon Heptaglotton,” or Dictionary of seven tongues. After expending upon it his whole fortune, and being thus reduced to great distress, he was appointed, in 1665, king's chaplain and Arabic professor at Cambridge, and presented to a prebend at Canterbury. His Lexicon was published in 1669, but most of the copies remained unfolded. Besides some other preferments, the laft that was conferred upon him was the rectory of Higham Gobion, in Bedfordshire. Among other ill-requited and unprofitable labours, he affifted Dr. Walton in his Polyglott Bible, for which he translated several books of the Old and New Testament, and diligently examined the eastern versions. At the restoration, he published a thin 4to. pamphlet to the honour of Charles II., containing copies of verses in all the languages of his Lexicon. He died at his rectory in 1685, and bequeathed all his MSS. to the university of Cambridge. About 550 copies of his Lexicon, which came into the possession of his niece and executrix, were configned in an old houfe to the mercy of the rats, so that scarcely one complete volume was left.

CASTELL, county of, in Geography, a principality of Germany, in the circle of Franconia, situated between the bithorphic of Wurzburg, the principality of Anhalt, the lordship of Limburg, and the county of Schwarzenburg; deriving its name from an ancient castle, which was destroyed by the peafants in 1525. It pays 18 florins for a Roman mouth, and is taxed at 18 tix-dollars 84 kreuzers. CASTELLA, Castles, in Italia Antiqua, were one of the three kinds of fortifications that were built along the line of Severus's wall; the other two being denominated stations and towers. These castles were neither so large nor so strong as the stations, but much more numerous, being no fewer than 81. In shape and dimension they were exact squares of 66 feet every way. They were fortified on every side with thick and lofty walls, but without any ditch, except on the north side, on which the wall itself, raised much above its usual height, with the ditch adjoining it, formed the fortification. The castles were situated in the intervals between the stations, generally at the distance of about seven furlongs from one another; and guards were constantly kept

CASTELLAIN, Caffellanus, the lord, owner, or captain of a castle; and sometimes the confable of a fortified house. Brct. lib. v. tract. 2. c. 16. 3 Edw. I. c. 7. It has likewise been taken for him that hath the custody of one of the king's manor-houses, called by the Lombards curtes, in English courts; though they are not castles or places of defence. 2. Inft. 31. And Manwood, in his Foref Laws, says there is an officer of the forest called Caffellanus.

CASTELLAN, in Biography. See Chatel.

CASTELLAN, the name of a dignity or office in Poland. The caftellans are senators of the kingdom, but senators of the lower classes; and in diets, sit on low seats behind the palatines, or great senators. They are a kind of lieutenants of provinces, and command a part of a palatinate under the palatine. They are divided into grand and petty caftellans: their office, in time of peace, is merely nominal; but when the military or feudal services are required, they are the lieutenants of the palatines, under whom they command the troops of the several districts.

CASTELLANA, CVITA, in Geography, a town of Italy, between Otricoli and Rome, the first of ancient Latium, on the approach to Rome by the Flaminian way. This town is considered by many antiquarians as the Pelmeneum of the ancients. It stands upon a high rock, and must formerly have been a place of great strength, but it is now in no very flourishing condition.

CASTELLANE, in Geography, a town of France, and principal place of a district in the department of the Lower Alps, situate at the foot of a mountain, on the river Verdon, in a pleasant and fertile spot; 12 leagues W. of Nice. The place contains 1562 and the canton 2477 inhabitants; the territory includes 225 kilometres and 13 communes.

CASTELLANETTA, a town of Naples, in the province of Otranto, the see of a bishop, suffragan of Tarento; 18 miles E.S.E. of Matera.

CASTELLANI, in Ancient Geography, a people of Spain, who inhabited the Tarragonensis, to whom Ptolemys assigns four cities. They occupied a part of Catalonia at the foot of the Pyrenees.

CASTELLANIA, a Spanish word, derived from Castello or Castle, and denoting a separate territory, in the manner of a province, independent of any other; in which its particular laws are observed, and which has a jurisdiction over all the places dependent on its capital.

CASTELLANO, a town of Naples, in the province of Bari, eight miles S.W. of Monopoli.—Also, a town of Italy, in the Venetian, belonging to the state of Venice; 16 miles S.W. of Verona.

CASTELLANUS, or Du Chatel, Honore, in Biography, a native of Brabant, studied medicine at Montpellier, where he took his degree of doctor in 1544. Being soon disdained for his learning, and abilities, he was sent for to Paris, and in succession filled the office of physician to Henry II., Francis II., and Charles IX. By his intercourse with Charles, he obtained a considerable addition to the salaries of the several professors of the university at Montpellier, which they have acknowledged by an inscription, in Latin, placed over the entrance into the college, the only memorial left of him, excepting an oration, on the excellence of the practice of physic, spoken on some occasion, not now known, and printed in 1555, 8vo. He died in November 1569, attending a part of the army of his sovereign to which he was also principal physician. Eloy. Dict. Hist.

CASTELLANUS, or Du Chatel, Peter, was born at Grammont in Flanders in the year 1585. Shewing an early disposition to literature, he was sent to Mons, and afterwards to Orleans, where he acquired such a proficiency in the knowledge of the Greek language, that he was invited to Lovain, in 1609, to fill the chair of Greek professor, then vacant. In 1618, he took the degree of doctor in medicine. The same year he published at Antwerp, "Vita illustrium Medicorum, qui toto orbis adhuc uque temporis, floruerunt," 12mo. It is a small volume, but the author has contrived, within that compass, to introduce the most striking passages in the lives of the more eminent physicians, who had flourished from the earliest period, to his time, with brief notices of their works. Although the accounts are taken almost entirely from other writers, whose words are frequently copied, yet the volume will always be esteemed, both as a monument of the learning, and diligence of the author, and for the perpetual references given to the sources from whence he obtained his information. He died in February 1652, aged only 47 years. Haller. Bib. Med. Eloy. Dict. Hist.

CASTELLANY, the district or extent of land under the jurisdiction of a lord caftellan.

The province of Flanders is divided into so many castellanies, each of which bears the name of the capital; as the castellany of Lille, of Ypres, of Ghent, &c. The court of castellany was anciently composed of the castellan, a fiscal procurator, notary, regifter, &c. In Poland, a castellan is a petty government under the administration of a castellan.

CASTELLARIUS, the keeper, or curator, of a castellum. Gruter gives an ancient episcopal inscription in memory of a castellarius.

CASTELLARO, in Geography, a town of Italy, in the duchy of Mantua; 10 miles E. of Mantua.—Also, a town in the state of Genoa; 11 miles N.E. of Vintimiglia.

CASTELLATION, Castellatio, in Middle Age Writers, the act of building a castle, or of fortifying a house, and rendering it a castle. By the ancient English laws, castellation was prohibited, without the king's especial licence. Dr. Cano.

CASTELLAUN, in Geography, a town of France, in the department of the Rhone and Mofelle, and chief place of a canton, in the district of Simmen, 22 miles S.S.W. of Coblenz. The place contains 620 and the canton 4977 inhabitants; the territory includes 28 communes.

CASTELLENGO, a town of Italy, in the country of Vercelli; eight miles S.E. of Biella.

CASTELLI, Benedict, Abbe, in Biography, an eminent mathematician, was born of an ancient and noble family at Brescia, in the year 1577. In 1605, he entered into a monastery of the order of St. Benedict in his native city. He was for some time a disciple of Galileo at Florence, and assisted him in his astronomical observations, and afterwards maintained a regular correspondence with him. Under his name the apology of Galileo against the censures of Leudo- vico delle Colombe and Vincent di Grazia appeared, though it was principally written by Galileo himself. From 1615 to 1625, he occupied the mathematical chair at Pisa. In 1625, Castelli was invited to Rome by pope Urban VIII., and made mathematical professor in the college della Sapienza. The subject of his particular attention, and in the investigation of which he chiefly excelled, was the motion of waters; and in 1628, he published two works upon it, which gained him much reputation; viz. "The Mensuration of running Waters," and "Geometrical Demonstrations of the Mensuration of running Waters." These have
have been lately inferred in the collection of the author's
works on similar topics, printed at Florence, with other
treatises, on the laguna of Venice, on the improvement of
the Pontine, Bolognese, Ferrarese, and Romagna marshes,
&c. Guglielminis, though in other things he impugns Caste-
elli, allows him the honour of having first applied geometry
to the motion of water; and Montinola (1 Hil. Math. t. ii.
p. 201.) calls him " The Creator of a new Pant of Hydraul-
ics." He died at Rome in 1644.

CASTELLI, Bernardo, an eminent painter of history and
portrait, was born at Genoa in 1577, and studied his art
under Andrea Semini and Luca Cambiaso, preferring the
principles of the first, and, in his practice imitating both. He
afterwards visited Rome for farther improvement; and there
he acquired distinction. He had a ready invention, and
when he chose to exert himself, he had sufficient correctness
and grace; but he became a mannerist, and frequently
adopted the colour and disposition of Vassali and Zuccheri.
The most distinguished poets of his time, whose portraits he
painted, celebrated him in their verses. Marino and Tasso,
in particular, were his intimate friends; and he made designs
for the Jezuista of the latter. The subject of his altar-
piece for St. Peter's at Rome was the call of St. Peter to
the apostleship; but this was afterwards removed, to make
room for one executed by Lanfranco. The principal works
of Castelli are at Genoa and Turin. As an engraver, his
style somewhat resembled that of Cornelius Buë. Among
other works in this department is a set of prints for
Tasso's poems. He died in 1639. Pilkington, by Fufili.
Strutt.

CASTELLI, Valerio, son of the former, was born at
Genoa, in 1625, and received his first instructions in the
school of Domenico Fiafella; but he gained his principal
knowledge in the art of painting by studying the works of
the most celebrated masters at Milan and Parma. He thus
much improved his taste of design, composition, and colouring.
His reputation for drawing, colouring, and the ele-
gant turn of his figures, placed him in a rank far superior
to his father. His most favourite subjects were battles; and
his horses are drawn in an admirably fine style. In this style
of painting he is said to have united the fire of Tintoretto
with the fine taste and composition of Paolo Veronese.
With respect to historical subjects he polished great merit
both in easel pictures and in those of larger dimensions.
The cupola of the church, and the anunciation at Genoa,
which is described as a noble composition, was painted by
this master; and at Florence, in the palace of the grand duke,
there is another excellent painting, the subject of which is
the Rape of the Sabines. His picture, representing Christ
taken down from the Cross, is in the collection of the earl
of Pembroke at Wilton; and it is said that more of the
easel pictures of Castelli are to be found in the collections
of England than in any other part of Europe. His health
was injured by his arduous labours; and he died at Genoa at
the early age of 34, in 1659. Pilkington.

CASTELLI, G. B. See CASTELLO.

CASTELLAR, in Geography, a town of Germany, in
the county of Tyrol; 7 miles S.S.E. of Bolzano.
CASTELLINA, a town of Italy, in the duchy of Par-
ma; 12 miles W.N.W. of Parma.
CASTELLO, a town of Naples, in the province of
Principato Cita; 16 miles W.S.W. of Policastro.
CASTELLO DELLA ABATE, a town of Naples, in
the province of Principato Cita; 29 miles S.W. of Can-
giano.

CASTELLO d'Albori, a town of Naples, in the province of
Principato Ultra; 10 miles N.E. of Benevento.

CASTELLO AERAGNO, a sea-port town on the N.W. coast
of the island of Sardinia, with a good harbour, the seat of a
bishop, suffragan of Saffiari; 18 miles N.E. of Saffiari. N.lat.
43° 55' E. long. 8° 37'.

CASTELLO BIANCO, a town of Genoa; 7 miles N. of Al-
benga.

CASTELLO di Chiuro, a town of Sardinia; 44 miles N.E.
of Cagliari.

CASTELLO Franca, a town of Naples, in the province of
Calabria Cita; 4 miles N.W. of Colona. Also, a town of
Naples, in the province of Principato Ultra; 14 miles E.N.E. of Benevento.—Also, a town of Italy, in the Trevisan,
belonging to the state of Venice; 9 miles W.S.W. of Tre-
viglio.—Also, a town in the state of Genoa; 11 miles N. E.
of Vintimigia.

CASTELLO St. Giovanni, a town of Italy, in the duchy of
Piacenza; 19 miles W. of Piacenza. It was taken by the
French in 1796.

CASTELLO a Mare, a town of Sicily, in the valley of
Mazara; 19 miles W.S.W. of Palermo.

CASTELLO a Mare di Stalia, a sea-port town of Naples, in
the province of Principato Cita, built near the ruins of
Pompeia and Stabia, the seat of a bishop, suffragan of Sor-
rento, containing 6 parish churches and 10 convents; 4 miles
N.E. of Sorrento. This is a long town, lying at the bottom
of the bay, sheltered to the south by high mountains that
approach so near to the water-edge, as to leave only a very
narrow slip for the buildings, many of which are boldly
and beautifully placed on the lower points of the hills.
The king has a charming villa above the city. The port
is small and artificial, more frequented by latinnail barks
than by ships. This place rofe by the ruin of the inland
towns.

CASTELLO a Mare della Brucia, a town of Naples, in
Principato Cita; 18 miles W. of Policastro.

CASTELLO Marini, a town of Portugal, in the province of
Entre Duero e Minho; 5 miles N.W. of Barcelos.

CASTELLO della Minerva, a town of Naples, in Principato
Cita; 16 miles S.W. of Amalfi.

CASTELLO Marchese, a town of Naples, in the province of
Abruzzo Ultra; 14 miles S.W. of Aquila.

CASTELLO Monferrato, a town of Portugal, in the province of
Beira; 2½ leagues E.N.E. of Beira.

CASTELLO Novato, a town of Italy, in the duchy of
Milan; 20 miles W. of Milan.

CASTELLO Nuova, a town of Italy, in the duchy of
Trulla, belonging to the state of Venice; 18 miles N.W. of
Udina.

CASTELLO Nuovo di Torri, a town of Italy, in the duchy
of Piacenza; 5 miles S. of Buffalo.

CASTELLO Nuovo, a town of the duchy of Modena; 9
miles N.N.W. of Reggio.

CASTELLO Nuovo, a town of Italy in the Brescian; 22
miles S. of Brescia.

CASTELLO de Nabrega, a town of Portugal, in the province
of Entre Duero e Minho; 2 leagues N. of Braga.

CASTELLO de Oniga, a town of Italy, in the Trevisan,
belonging to the state of Venice; 12 miles N.W. of Tre-
viglio.

CASTELLO della Orfo, a town of Naples, in Principato
Cita; 6 miles S.S.W. of Salerno.
CASTELLUM, in Geography, a town of Naples, in the province of Capitanata; 6 miles from Troja. This is a kind of double town; one part of which is magnificently situated upon a rocky eminence, with a declivity that sent the housetops as if they were upon terraces, and the other part, built at its foot, amidst a delightful tract of fields, rich in vines and fruit-trees, and bounded by rows of towering oaks.

CASTELLUM, in Ancient Geography, a place of Palestina, on the sea of Galilee, near Tiberias. - Alfo, an Episcopal see of Africa, in Numidia. - Alfo, an African episcopal see, in Mauritania Cezarianis. - Alfo, a place and episcopal see of Africa, in Mauritania Cezarianis. - Alfo, a place of Italy, S.W. of Faentia, belonging to the Boi.

CASTELLUM Dachii et Germanici, a place mentioned by Tacitus (Annal. 156), on the other side of the Rhine; the ruins of which still bear the name of "Ali Konigstein," or the old royal monument.

CASTELLUM Flabriitanum, an episcopal city of Africa, in Mauritania Cezarianis. - C. Medium, an episcopal see of Africa, in Mauritania Cezarianis; called "Monumentum Medium" by Ammianus Marcellinus. - C. Memphiterum, Caxtel, a fortress of Gaul, on the left of the Meuse. - C. Ministerianum, an episcopal see of Africa, in Mauritania Cezarianis. - C. Moricerum, Caxtell, a place of Gaul, called simply Caftellum in the Itinerary of Antonine; it was at some distance to the east from Bononia, and N.E. of Tarraconae. See Caxtel. - C. Pietonae, an episcopal see of Africa, in Mauritania Cezarianis. - C. Romanum, Brittenum, a fortress at the extremity of the Rhine, called by some authors Arx Brittainum, which see. - C. Tutoportus, an episcopal see of Africa, in Mauritania Cezarianis. - C. Tutilianum, or Titoianum, an episcopal see of Africa, in Numidia. - C. Triarius, Caxtel, a fortress situate to the right of the Rhine, at a place where it received the name of Menus, the Maevus. This fortress was repaired by Julian, and is different from another situated a little more to the east, and which is mentioned by Tacitus.

CASTELLUS, BARTHOLOMEEUM, in Biography, an Italian physician of considerable learning and eminence, practised at Melilla the latter part of the 16th and beginning of the 17th centuries. He was author of two works, both for a long time extremely popular. "Tutius Artis Medicae, Methodus divisa, Compendium et Synopsis, in qua quidquid ab Hippocrates, Galeno, Avicenna, humanissque in Arte Doctoribus scriptum est, collector um." Melian. 1597, 4to. This has been many times reprinted, the last time at Geneva, in 1649. "Lexicon Medium Graeco-Latinum," Venice, 1607, 4to. This work still retains its popularity. It has passed through numerous editions, and been much enlarged and improved, particularly by Vander Linde, and afterwards by Jacob Bruno. The last edition was printed at Naples in 1741. Haller Bib. Med.

CASTELUZZA, in Geography, a town of Naples, in the province of Principato; 12 miles E. of Salerno.

CASTELUZZA DI SCHIANO, a town of Naples, in the province of Capitanata; 8 miles E. of Troja.

CASTELMARMORA, a town of Asiatic Turkey, in the province of Natoia; 28 miles S.W. of Mogla.

CASTELMIRABEL, a town of the island of Candia, in the Mediterranean, on the north coast of a large bay; 18 miles W. of Sestia.

CASTELNAU, MICHAEL DE, in Biography, an eminent commander and statesman in the reigns of Charles IX. and Henry III. of France, was employed in many important negotiations, and being five times ambassador in England, resided here for 10 years successively in his first embassy. He took an active part in favour of Mary queen of Scots; endeavoured to reconcile her to her husband Darnley, and intervening in her favour under the harlots treatment of Elizabeth. He died in 1592. The memoirs of his negotiations, published by Le Laborde, in 2 vols. fol. in 1675, and repeated at Brussels in 1731, are regarded among the most curious and valuable materials of the age, and written in a pure and unaffected style, without passion or partiality. His daughter Catherine was mistress of four languages, and translated her father's memoirs into English, Nouv. Dict. Hist. Robertson's Hist. of Scotland, vol. i. p. 318, &c. vol. ii. p. 128.

CASTELNAU de Bonnafous, in Geography, a town of France, in the department of the Tarn, and district of Alby; one league W. of Alby.

CASTELNAU SUR GUPIE, a town of France, in the department of the Lot and Garonne; 14 league N.N.W. of Marsanne.

CASTELNAU de Magnoas, a town of France, and seat of a tribunal, in the department of the Higher Pyrenees, and chief place of a canton in the district of Bagneres; 20 miles E. of Tarbes. The place contains 1200, and the canton 10,296 inhabitants; the territory comprehends 1924 kilometres and 32 communes.

CASTELNAU de MEUX, a town of France, in the department
ment of the Garonne, and chief place of a canton in the district of Bordeaux; 13 miles N.N.W. of Bordeaux. The place contains 1,598, and the canton 12,574 inhabitants; the extent of the territory comprehends 1,950 kilometres and 19 communes.

CASTELNAUD-DE-MONTIGNAC, a town of France, in the department of the Tarn, and chief place of a canton in the district of Graulhet; 2 leagues N.W. of Carcassonne. The place contains 2,573, and the canton 974; inhabitants; the territory includes 1,019 kilometres and 15 communes.

CASTELNAUD-LE-CHATEAU, a town of France, in the department of the Lot, and chief place of a canton in the district of Cahors; 4 leagues S. of Cahors. The place contains 4,771, and the canton 8,801 inhabitants; and the territory includes 1,824 kilometres and 8 communes.

CASTELNAUD-DE-SOUTHEAUX, a town of France, in the department of the Lot, and chief place of a canton in the district of Cahors; 4 leagues N. of Cahors.

CASTELNAUDARY, a town of France, and principal place of a district, in the department of Aude; before the revolution, the capital of Lauragais; seated on an eminence, near the grand referror which supplies the canal of Langdoc. The place contains 7,919, the north canton 13,815, and the south canton 12,629 inhabitants; the territory of the former includes 28,5 kilometres and 19 communes; that of the latter 14,5 kilometres and 13 communes. N. lat. 43° 30' E. long. 1° 51'.

CASTELMONTE, a town of Piedmont, in the marquisate of Ivrea; 7 miles S.S.W. of Ivrea.

CASTELPROTISSA, a town on the south coast of the island of Candia; 25 miles S.S.W. of Candia.

CASTELVETRO, Lewis, in Biography, an eminent Italian scholar, was a native of Modena, descended from a noble family, and born in 1535. Educated in the universities of Bologna, Ferrara, Padua, and Sienna, he graduated at the latter place in law, being designed by his father for that profession; but his natural inclination led him to the cultivation of polite literature. In his native place he was assiduous in promoting letters among his countrymen, and became an active member of the newly-erected academy. His connection with this learned body occasioned his being suspected of heresy, and his quarrel with Ambib Calvo (see Carlo) contributed to his being accused to the inquisition as unfound in the faith. In 1557 he was cited to Rome, but dreading an examination, he fled from there, being condemned by a mutual council; but at length, in 1560, he repaired thither, and after being thrice examined, he thought it noth prudent to make his escape; the confiance of which was the publication of a sentence, previously pronounced against him, as a contumacious heretic. At Chiavenna, where he settled for some time, he gave private lectures to several students on Homer, and on the rhetoric addressed to Herennius. From thence he removed to the court of Maximilian II. at Vienna, and dedicated to that emperor his commentary on Aristotle's Poetics. Being driven from Vienna by the plague, he returned to Chiavenna, where he died in 1571. Castelvetro was an accurate grammarian, and an acute though somewhat too censorious critic. He took pains in perfecting the Italian language, and wrote remarks of a grammatical and critical kind on several authors, both ancient and modern, which were first published by Muratori in 1727. His "Examination of the Rhetoric addressed to Herennius,"

was printed in 1653. His "Exposition of Petrarch's Poems," which he left unfinished, was published by his nephew. He composed various pieces in Latin verse, with great elegance; and his life in Greek was mantled in his version, with a commentary, of Aristotle's Poetics, and in his Italian translation of Chrysoloras's exposition of the Goethe. He also added the Provençal tongue, and translated, in conjunction with Bubhiner, into Italian, many of the poems and lives of the Provençal poets, and gave a grammar of the language. Gen. D. de Gen. Barlow.

CASTER, in Geography, a town of Germany, in the circle of Weilphalia, and duchy of Juliers; 8 miles E.N.E. of Juliers.

CASTER, or Castor. See Castor.

CASTETS, a town of France, in the department of Landes, and chief place of a canton in the district of Dax; 7 miles N. of Dax. The place contains 877, and the canton 5429 inhabitants; the territory includes 643 kilometres and 10 communes.

CASTHANEE, or Castanea, in Ancient Geography, a town of the Thessaly, in Magnesia, at the foot of mount Pelion.

CASTIGATION, Cafigatio, among the Romans, the punishment of an offender by blows, or beating with a wand or switch. Cafigation was chiefly a military punishment, the power of inflicting which on the foledge was given to the tribune. Some make it of two kinds, one with a flick or cane, called sufigatio; the other with rods, called flagellation; the latter was most dishonourable.

CASTIGATIONS, in a Literary Sense, denote corrections, or emendations of the text of an ancient writer.

CASTIGATORY. See Cucking stool.

CASTIGLIOLA, in Geography, a town of Piedmont, in the county of Affi; 5 miles S.S.W. of Affi.

CASTIGLIONE, Baldassar, in Biography, an eminent Italian and writer of Italy, was born of noble parents at the villa of Castiglione near Mantua in 1492. He studied at Milan, and commenced his political career at an early period, as page to Lewis Sforza, duke of Milan. In 1509 he attached himself to Gonzaga, marquis of Mantua, and in 1504 entered into the service of Guidubaldo, duke of Urbino, in whose court, which was then the favourite resort of science and letters, he resided for several years. This duke sent him as his ambassador to Henry VII. king of England in 1509, and in the following year he attended in the same capacity on Lewis XII. then at Milan. On the death of Guidubaldo in 1508, he remained in the service of the new duke, Francis Maria della Rovere, whom he accompanied in several military expeditions as lieutenant-general of the army of the church under pope Julius II. He was recompensed for his services in 1513 by the castle of Nuvilara near Pescara, and the grant was confirmed to him by pope Leo X. Upon his return to Mantua, he regained the favour of the duke Gonzaga, whom he had offended by quitting his service, and in 1516 married Maria Hippolita, a lady no less illustrious for her birth than for her beauty and accomplishments. This lady was distinguished by her Latin and Italian contemporaries, both in prose and verse; and her poems are published in a collection of the works of five illustrious Italian poets. This connection terminated in 4 years by the death of Hippolita. Castiglione was afterwards employed by the marquis Frederic of Mantua as his ambassador to Rome, where he remained several years, and enjoyed that kind of literary society to which he was attached and of which he was a principal ornament. He was particularly distinguished by his researches into all the remains of antiquity, and by his exquisitely
quite taste in the fine arts. In 1522 he returned to Mantua, with a view of serving his prince in the war against the French. When he again visited Rome, he was employed by Pope Clement VII. in 1524 as museo to the emperor Charles V., but failing to terminate the difference between the imperial and papal courts, and incurring unjust suspicions on the part of Clement, his disappointment and anxiety were the occasions of an illness, of which he died at Toledo in 1529. Five years after his death, his body, which had been interred with great solemnity in the cathedral, was removed by order of his mother to a church five miles from Mantua, in which a superb mausoleum was erected to his memory, with an inscription written by cardinal Bembo. His statue has been since placed in the royal academy of Mantua. The most celebrated of his works is "Il Cortigiano" or the Courtier, *discussing the manner of living in courts, so as to be useful and agreeable to the prince, and containing a variety of reflections and maxims, delivered in an easy and elegant style, which has rendered it an original and classical work. It was finished in 1518, reviewed by his friend Bembo, but not printed till the year 1528. It passed speedily through several editions, and was translated into most of the languages of Europe. It is denominated by the Italians "the golden book," and a fine edition of it was printed to lately as 1733 at Padua, with the life of the author prefixed by Bernardino Mariani. On account of some free expressions it was in the list of prohibited books; but in 1576 the author's son, obtained for a corrected form of it a licence from the congregation of the index. The letters of Castiglione were published at Padua in 2 vols. in 1760, with annotations by the abbe Sarrafi. His Italian poetical compositions have been published separately, and his Latin productions were published in the first volume of the "Delizia Poet. Italor. by Gruter." Moreri. Gen. Biog.

CASTIGLIONE, Giovanni Benedetto, called Grechetto, an admired painter, was born at Genoa in 1616, and studied first under Battifia Pagi and afterwards in the academy of Giovanni Andrea de Ferrari; but he owed his chief improvement to the instructions of Vandyck, who at that time resided at Genoa. His manner of design, in all branches of his art, was grand; and he equally succeeded in all; in sacred and profane history, landscape, cattle, and portraiture; all which he executed with an equal degree of truth, freedom, and spirit. His predominant inclination, though he polished an universal genius, led him to select rural scenes and pastoral subjects, markets, and animals, in which he had no superior. He combined with great readiness of invention a bold and noble tint of colouring, elegant, and generally correct, drawing, a judicious touch, and a free and firm pencil; and he also happily applied the chiaro-scuro, which he thoroughly understood, through all his works. In the chapel of St. Luke's church at Genoa, is an excellent picture by this master; also in the Palazzo Brignole is a grand composition; and at Palazzo Coraglia in the same city is an historical picture of Raphael concealing the Teraphim from Laban, in which the figures and animals are very fine. The etchings of this celebrated artift, which are numerous, are spirited, free, and full of taste; and their effect is, in general, powerful and pleasing. Among his most effective plates, may be reckoned the following, all from his own compositions: viz. "Animals coming to the ark!" "Laban searching for his gods in the tent of Jacob;" "The angel appearing to Joseph in a dream;" "The nativity of Saviour;" "The flight into Egypt;" "The resurrection of Lazarus;" "Diogenes with his lanthorn!" "A magician with several animals;" "The little melancholy!" "A ruin with a vase, and two men, one of them pointing to a tomb!" "two rural subjects, with foars and satyrs;" and two "sets of heads." He died in 1670. Pilkington. Strutt.

Francisco Castiglione, the son of Benedetto, was the disciple of his father, and was born at Genoa. He inherited in a very considerable degree the talents of his father, and imitated his style and manner exactly, in composition, handling, and design. Many pictures, ascribed to Benedetto, and occurring in sales and collections, are thought to be copies after him by his son Francisco, or perhaps originals of the younger Castiglione. Pilkington.

CASTIGLIONE, in Geography, a town of Italy, belonging to the republic of Lucca, in the Medenese; 18 miles N. of Lucca.—Alfo, a town of Italy, in the republic of Lucca, 8 miles S.W. of Lucca. —Alfo, a town of Italy, in the duchy of Tuscany, situated on a lake near the sea. This lake, which is two leagues in diameter, and communicates with the sea, produces great quantities of salt. The refineries contain 4,859,000 cubic feet of water, which after evaporation, leave 14,000,000 pounds of salt.—Alfo, a town in the flat of Genoa; 23 miles E. of Genoa.—Alfo, a town of Naples, in the province of Principato Cita; 5 miles N.E. of Salerno. —Alfo, a town of Naples, in the province of Abruzzi Cita; 6 miles E.S.E. of Civita Borella. —Alfo, a town of Naples, in the province of Calabria Cita; 17 miles S.S.W. of Cofenza. —Alfo, a town of Sicily, in the valley of Demona; 9 miles W.N.W. of Taormino. —Alfo, a town of Italy, in the duchy of Mantua; 9 miles W. of Mantua.

CASTIGLIONE di Gati, a town of Italy, in the Bolognese; 20 miles S. of Bologna.

CASTIGLIONE della Stiviera, a town of Italy, and principality, in the duchy of Mantua, defended by some fortifications and a citadel; and containing about 3000 inhabitants; 20 miles N.W. of Mantua. In 1796 a battle was fought near this town between the Austrians and French, in which the latter took 6000 prisoners.

CASTILIONIA, in Botany, Flor. peruv. pl. 37. Clafs and order, polygonia monacis.


CASTIGLUNI, in Geography, a town of Naples, in the province of Principato Ultra; nine miles E.N.E. of Conza.

CASTIL BLANCO, a town of Spain, in the province of Andalusia; five leagues N. of Seville.

CASTILE, a country of Spain, comprehending the provinces of Old and New Castile; and the kingdom of Castile. Some have referred the origin of this name to a certain old Spanish tribe, or nation, called by the Romans "Catalani," who are supposed to have inhabited these parts of Spain, as well as Catalonia. But others with greater probability have traced it no higher than the recovery of this country out of the hands of the Moors; at which time, they say, there was a strong castle built for the defence of the frontier, in which the count, or great officer of the province, resided, from whence it took its name and its arms. Whilfe Old Castile, so called because it was recovered from the Moors long before that which is styled the New, remained under the dominion of the Moors, there were several great lords who
who maintained themselves in the possession of certain districts, and who, gradually increasing in wealth and power, at length threw off the yoke of the infidels, and put themselves under the protection of the kings of Oviedo. According to this account, it is probable that these lords had each of them a well fortified mansion, or castle; whence, at the emancipation of this province from the yoke of the Moors, it might well receive the name by which it has ever since been known. These lords, supported by their new protector, were not only able to defend their frontier, but to extend their little territories by their excursions against the Moors, as often as any favourable opportunity occurred, and hence assumed the title of counts; and being regarded as feudatories of the monarchs before mentioned, were summoned in time of war to repair with their vassals to attend the king's standard, and in time of peace were called to the assemblies of the estates. The title of these counts, mentioned by name in the Spanish histories, is Don Rodriguez, who assisted in the reign of Don Alfonso el Callo, or the Chaffe, about the close of the 9th century, whom he assisted in his wars against the infidels.

Castile, from being only a county, and subject to the kings of Leon, was erected in 1016 into an independent kingdom: and in 1032 the two kingdoms of Leon and Castile were united in the person of Ferdinand I. of Leon, and II. of Castile. This union was rendered perpetual in the person of Ferdinand II., after the death of Don Alfonso of Leon, A.D. 1252; from which time these two kingdoms have never been separated, but have gradually drawn to them all the other sovereignties in Spain; that of the Christians by inheritance or marriage, and that of the Moors by conquest. Upon the death of Don Juan, king of Aragon, in 1479, Aragon and its dominions were united to the crown of Castile, in the persons of their catholic majesties Ferdinand and Isabella, who, in 1474, had been proclaimed king and queen of Castile and Leon. See ARAGON. After this period the Spanish crowns were united and defended in the same line; and the kingdom of Castile was lost in that of Spain. See SPAIN.

Castile, Old, a province of Spain, with the title of kingdom, was formerly part of the Roman Tarracoensis, and borders all the way on the south to New Castile, from which it is divided by a high chain of mountains, extending directly from west to east; on the north it is separated from Alurias and Bifcaéy by another range of hills branching out from the Pyrenees; but between these two provinces it has a narrow lip of land which reaches quite to the bay of Bifcaéy: on the east it is parted by the Ebro and the mountain of Dover, for a considerable length, from Navarre and Aragon; and on the west it is bounded by Leon. The greatest extent of this province from north to south reaches from 40° 10' to 43° 15' of N. latitude, and from 2° 30' to 4° 10' of W. longitude; i.e. about 180 miles from N. to S. and about the same number from E. to W. in those parts where it has both ways the greatest extent; for its figure is very irregular, and its dimensions are in various parts very different. The principal rivers in this province are the Ebro, Duero, Pifurga, Ariançon, and Añanca; and the chief towns are Avila, Burgos, the capital, Calahorra, Segovia, Siguenza, and Valladolid. Its climate is somewhat different from that of New Castile, as it is more mountainous, in some degree that some have reprented it as a terrace formed by the mountains of Bifcaéy, or by the Pyrenees, of which there are a branch. In summer this mountain-plain is defitute of water, and burnt up with heat. But, in general, whilst the valleys are very hot, the upper grounds are proportionably cold and bleak. In this country no other means are employed to counteract the severity of the weather and the bleak winds, which, on the high open plains, are very brisk, before a large clashing dust, (brazen,) which is usually placed beneath the table. Stoves and chimneyes are never seen in common houses. Snow covers the tops of the mountains through the summer; and it is carried away and fold in the towns, for cooling their wine. The soil, though in various parts cold, is moderately good, and might be rendered much more productive by better cultivation. The wine is much extolled; and the plains are covered with cattle, and more especially with sheep, the wool of which is much valued.

CASTEL, New, called also "The kingdom of Toledo," which was formerly its capital, a province of Spain, bounded on the north by Old Castile, from which it is separated by a chain of mountains known by the name of the country through which they run; on the east it is divided by a similar ridge from Arragon and Valencia; on the south it is parted from Andalusia by the mountains called Sierra Morena, and by an imaginary line from Murcia; and on the west it is separated from Estremadura and Leon by a ridge of hills called Guadaloupe and La Sarena. Its length from north to south is about 180 miles, and its greatest breadth about the same number, though its form is very irregular. New Castile confines of three cantons, viz. La Mancha, the southern part, La Sierra, lying towards the cant, and Algaris, which is the northern part. Its principal rivers are the Tagus, Guadiana, Guadalupe, Alcar, Xara, and Guadarama, besides several others of less note. The capital of this province is Madrid. As it is inland and surrounded by high mountains, its climate is hotter in summer, and colder in winter, than other districts which lie along the sea-coasts in the same latitude. It is, however, fabulous, and the soil is generally well-tended, and needing cultivation. The northern parts produce fruits and wine, and the southern, good pastures and fine wool.

CASTELL del Oro. See TERRA FIRMA.

CASTILLAN, in Commerce, a gold coin, current in Spain, valued at fourteen reals and a half.

CASTILLAN also denotes a weight used by the Spaniards in the weighing of gold, containing the hundredth part of a Spanish pound. It is also used at Buenos Ayres, and the mines of Chili and Potofii.

CASTILLA, in Military Language, a term that was formerly made use of for the denomination of a tower or caillé. This attack became also a sort of military sport or play, in which those who carried it on used snow-balls. In 1546, the division, being surprized in one of those attacks, that was executed at Roche Galiou, became of caste, and heated, a circumstance that cost the duke d'Enghien his life, and put a period to the games or sports in France called Castilles, as that which occasioned the death of Henry III., put an end to the martial game or exercise of tournament.


Gen. Ch. Cal. perranth one-leaved, tubular, longitudinally cloven in front, more than half-way down, nerved, coloured, somewhat swelling at the base. Cor. monopetalous, gapping; upper lip long, channelled, curved inwards, emarginate, pubescent on the back; lower lip very short, trifid; segments acute, with two glands between them, inserted into the throat of the corolla. Stam. filaments four, inserted into the base of the corolla, the length of the upper lip, filiform, smooth; the lower pair a little shorter;
anthers twin, linear, oblique. 
Figg. germ superior, oblong; style bilobate, the length of the flower; stigma simple, oblate. Peric. capsule ovate, compressed, two-celled; the partition contrary to the valves. Seeds numerous, small.

Eff. Ch. 'Calix tubular, cloven longitudinally more than half-way down; lower lip of the corolla very short, trifid, with two glands between the segments; capsule two-celled.'

Sp. 1. C. fijjilhia, Smith Indic. tab. 39. Mut. Amer. vol. i. tab. 11. Lam. Illust. pl. 519. fig. 2. "Leaves pinnate-gnath near the tip." Root perennial, branched, fibrous. Stem three or four feet high, herbaeeous, or somewhat woody, erect, roundish, with few branches, pubescent. Leaves alternate, sessile, spreading, entire at the base, pinnatifid near the tip, pubescent on both sides, three-nerved; segments from three to seven; stipules none. Flowes: towards the ends of the larger branches, solitary, peduncled, pinnate, probably scarlet; proper bracts none; peduncles round, pubescent, scarcely one-third of the length of the leaves.

A native of New Granada. 2. C. integrifolia, Smith Indic. tab. 39. Mut. Amer. vol. i. tab. 12. Lam. Illust. pl. 519. fig. 2. "Leaves linear-lanceolate, entire." Stem herbaeeous, round, upright, branched, leafy, flatly rough, with hairs. Leaves alternate, sessile, spreading, obtuse, flatly channelled, nerved, pubescent on both sides, stipules none. Flowes: on the elongated ends of the branches, forming a sort of raceme, each from the axil of its own bracteate leaf, a little smaller than those of the preceding species; peduncles filiform, upright, shorter than the leaves. A native of New Granada, where both species were discovered by Mutis.

CASTILLO, CASTELLO OF CASTELLI, GIO BOTTSTA, in Biography, an eminent painter of history of the 16th century, commonly called II Bergamascus, in contradistinction to Gio. Bat. Càstelli, a Genoese, scholar of Cambiafo, and the most celebrated miniature-painter of his time, was born at Bergamo, and conducted to Genoa by Aurelio Bufo of Crema, and left by him in that city. In this forlorn state, he was patronized by the Pallavicini family, who sent him to Rome, where he was formed an architect, sculptor, and painter, not inferior to Cambiafo. At Rome, Palomino reckons him among the scholars of Michael Angelo. He was the companion of Lucas Cambiafo, and adopted his technical principles; and we discover, says Mr. Fuseli, the style of Rafaello verging already to practice, but not so mannered as that which prevailed at Rome under Gregory and Sixtus. In Cambiafo we recognize a greater genius and more elegance of design; in Castlello, greater diligence, deeper knowledge, a better colour, a colour more nearly allied to the Venetian than the Roman school. These two artists affiled each other, even on occasions where they appeared to be competitors. Thus, at the Nuntiata di Portonia, Lucas on the pannels represented the final doom of the blessed and the rejected in the last judgment; whilst G. Batilla on the ceiling, expressed the judge in an angelic circle receiving the elect. His attitude and semblance speak the celestial welcome with greater energy than the adjacent capitals of the words Venite Benedicti. This is a picture fluided in all its parts, of a vivacity, composition, and exequion, which give to the pannels of Lucas the air of a work done by a man half asleep. He also worked alone; such is the S. Jerome surrounded by monks frightened at a lion, in S. Francescô di Castello, and the crowning of S. Sebastian after martyrdom in his own church, which is a picture as rich in composition as fluided in execution, and superior, says Mr. Fuzelli, to all my praisé. This artist, though little known in Italy, passed the last years of his life at Madrid, as painter to the court. He died in 1570, at the age of 72 years. He had two sons, Fabrizio and Granello, whom he took with him to Spain as his affidants, whose works in the Fleurier are much commended. Pilkington's D. B. by Fuseli.

CASTILLO Y SAVARDA, ANTONIO DEL, a celebrated Spanish painter, was born at Cordova in 1602, and having studied under his father Angullin, perfected himself in the school of Zurbaran at Seville. On his return to his native place, he was employed in a variety of works, evincing his great skill in drawing and design, but not equal in colouring. He practiced in history, portrait, and landscape, with great reputation. In 1646, he revisited Seville, where, on seeing some of the brilliant productions of Murillo, he gazed on them with silent admiration, and then suddenly exclaimed, "Cañillo is no more." After his return to Cordova, he died in less than a year of melancholy and despair. Castillo united the talent of poetry to that of painting. Cumberland's Anecdotes of Spanish Painters. Nouv. Dic. Hist.

CASTILLO DE SANCHE ALARCA, in Geography, a town of Spain, in Navarre; 5 leagues from Tudela.

CASTILLON, a town of France, in the department of the Gironds, and chief place of a canton, in the district of Libourne; 3 leagues S.E. of Libourne. The place contains 1,750, and the canton 10,772 inhabitants; the territory includes 17½ kilometres and 16 communes.

CASTILLON, a town of France, in the department of the Ariège, and chief place of a canton, in the district of St. Girons; 7 miles S.W. of St. Girons. The place contains 742, and the canton 12,112 inhabitants. The territorial extent comprehends 350 kilometres and 25 communes.

CASTILLONES, a town of France, in the department of the Lot and Garonne, and chief place of a canton, in the district of Villeneuve-d'Agren; 5 miles E. of Lanzun. The place contains 1,756, and the canton 7,123 inhabitants; the territory includes 17½ kilometres and 15 communes.

CASTINE, the shire-town of Hancock county, in the district of Maine, N. America, situated on Penobscot bay. It was separated from Penobscot, and incorporated in 1756. It takes its name from a French gentleman who resided here more than 150 years ago.

CASTINE River, which is about 14 miles long, is navigable for 6 miles, and has several mills at the head of it. It discharges itself into Penobscot bay.

CASTING is sometimes used for the quitting, laying, or throwing aside any thing; thus, deer cast their horns, snakes their skins, lobsters their shells, hawks their feathers, &c. annually.

Casting of feathers, is more properly called moulting, or moulting.

A horse casts his hair or coat at least once a year, viz. in the spring, when he casts his winter coat, and sometimes at the close of autumn he casts his summer coat, in cale he hath been ill kept.

Horses sometimes also cast their hoofs, which happens frequently to coach-horses brought from Holland; which being bred in a moist, marshy country, have their hoofs too flabby; so that coming into a drier soil and less juicy provender, their hoofs fall off, and others, that are firmer, succeed.

CASTING is also used for distributing or disposing the parts of a thing to the best advantage.

The casting of a building is more properly called composition.

Theatrical writers speak of casting a play, i.e. disposing the several parts or characters to proper actors.

CASTING of candles, signifies filling the moulds with tallow. See Candle.
Casting a model, in Rural Economy, is a term that implies a more of the proving abortive.

Casting of design, among Painters, denotes the distribution of the parts; and the drapery is made to be well cast, when the parts are distributed in such a manner as to appear neither the result of more chance than of art, hands or labour. In that style of painting which is called "the grand," the drapery should be great, and as few as possible, because their high simplicity is more indecent of great lights. But it is an error to design drapery that are too heavy and cumbersome, for they ought to be suitable to the figures, with a combination of ease and grandeur. Order, contrast, and variety of lines and faces, constitute the elegance of drapery; and diversity of colours in those flaps contributions extremely to the harmony of the whole in historic compositions.

Casting, in Falconry, is any thing given an hawk to purge and cleanse his gape. Of these there are two kinds, viz. plumage, i.e. feathers; and cotton, the latter wherein is generally in pellets about the big size of hazel-nuts, made of soft fine cotton, and conveyed into the gape after supper. In the morning the will have cast them out; at which time they are to be observed, and from the colour and condition they are found in, the state of their body is conjectured. If they be cast out round, white, and not flinting, nor very moity, it is an indication all is well; if otherwise, particularly if black, green, fliny, or the like, he is disrevered. The casting of plumage is observed after the same manner as that of cotton.

Casting a figure, among Architects, the erecting of a celestial theme, and dividing the heavens into houses.

Casting, in Foundry, is the running of a melted metal into a mould prepared for that purpose.

The great importance of a knowledge of casting to a mechanic, on account of the vast quantities of cast iron now used in machinery, has induced us to give a particular description of this branch of the founder's art.

There are three sorts of casting, 1. open found casting; 2. found casting between flaps; and 3. loose casting; in mould of which, an exact pattern, usually of wood, of the subject to be cast, is given to the founder.

1. Molt articles, every part of whose surface on one side is in the same plane (which we will call the horizontal plane), and every parallel section of which is of the same size in each part as the horizontal plane, or constantly decreasing as they recede downwards from it, and the edges of all which sections fall within perpendiculars, let fall from the edges of the plane immediately above it, may be cast in open found because, as the founders express it, every such pattern will lift out of the found, wherein it has been imbedded as deep as its upper or plane surface, to form the mould for the metal.

The floor of every foundry is for many feet deep composed of a loamy found (of which great quantities are brought to London from near Woolwich) so that deep pits may be dug, to bury large moulds in. [See Foundry] An example of open found casting is shown in Plate of Casting, figs. 1 and 2, which represent the arms of a large wheel, the rim of which is to be ferreted on by the flanges a, a, fig. 1; b b is the arm; d is a rib cast with it to strengthen it, the other side of the arm must be planed; e is the opening through which its shaft is to pass. In the place where the mould is to be made, a layer of sand, e d, fig. 2, is lightly sprinkled through a flute on the floor, and the pattern A is placed down into it, perfectly level; the next operation is shovelling the sand up all round, level with the top of the pattern, and ramming it down, with a trowel, fig. 4; a sponge is then used for slightly wetting the sand all round the edges of the pattern to make it adhere together; the next operation is lifting the pattern out of the sand by one or more screws, fig. 5, screwed into the wood; if the pattern is small, this is done by one or more men, but in very large works it is done by a crane; the core for the bolt holes through the flanges, a, a, fig. 1, are made by sticking pieces of dried clay in the sand in the proper places, and the core for the hole e, made of clay, is also let in his place; the workman then takes a pair of bel lows for blowing away any small pieces of sand which may have fallen into the mould. It is now ready for filling with metal; in small works this is done by ladles, and in large, by small ditches made in the sand, from the mould to the mouth of the furnace; when the mould is filled, the metal is covered up with sand to keep the air from it.

II. Sand-casting between flaps is used for those articles which if they were cut into two or more pieces (provided the cutting planes were parallel to each other) each separate piece might be cast in open sand. A specimen of this kind of casting is shown in fig. 6, which is an endless screw and pin, often composed of cast iron. A B and C D are channels called flaps, with four handles, c d, c f, to lift by; a b, l, m, are iron points fitting into holes g, b, i, k, in the other flaps C D, for securing them when they fit each other. The under flap C D is let upon a board, filled with sand, and the frame is rammed tight in it: the workman then takes the pattern E F, and presses one half of it into the sand, and smooths the sand up to the sides of the pattern with a trowel, fig. 3; he then fits the empty flap, A B, over the other, C D, putting its points a b, l, m, into the holes g, b, i, k; and after sprinkling some sand which has been burnt over the sand in the under flap, he fills the upper one with sand, and ram it down; he next with a piece of wood, put through the sand in the upper flap, makes a hole blown at p, to pour the sand through; the upper flap, A B, with the sand in it, is then lifted off by men, or in large works, by a crane, and the pattern, E F, lifted out; the flap, A B, is then put on again, and heavy weights are laid on it to keep it down, ready for casting. It must be observed, that at every highest point of large moulds a small hole must be made through the sand in the upper flap, to allow the air to pass out of the mould when the metal is poured in.

Fig. 7, 8, and 9, show the manner of casting a cog-wheel with eight arms, all of which are ribbed on both sides. The pattern is laid upon a board with the face shown in fig. 7, upwards; an empty flap is laid upside downwards over the board and pattern; it is filled with sand and rammed tight; a plain board is then laid upon the flaps, and two men turn it over, bringing the pattern to the top, as shown in fig. 10; the workman with a small trowel, fig. 3, then digs all the sand out of the space A A, fig. 10, between each arm, leaving it level with the tops of the ribs, a b, c d, &c., fig. 7; into each of these spaces thus formed, a piece of iron plate, fig. 8, cut to suit the same, is laid; it has an iron rod, a, projecting from the upper side and two points, b, d, at the under side, which are inserted into the sand between the arms, so that the two edges, c f, touch the upper edge of the arms a, b, of the wheel, fig. 7. The spaces above these plates are then filled with sand and rammed down level with the rest of the sand in the flap: burnt sand is then sprinkled over the lower flap to prevent the sand which is now to be rammed into the upper flap. C D, from adhering to that in the lower; the holes for the metal are made by means of the top flap, and then taken off; the iron plates and the sand upon them are taken out by the ends of the iron, a; the sand round the pattern is slightly wetted, and the cogs of the wheel are taken out one by one (for which purpose they are only fixed on by a dovetailed groove cut in the rim, see M) and then the whole wheel is lifted out by the screw, fig. 5; the iron 5 2 plates
plates are then put again in the place where they flood before, being determined by the holes which the points, b, d, made in the foundy. The hole H through the wheel, which is to receive the shaft, is filled in the pattern, and a projection of the same size as the intended hole is fixed on; this projection forms a recess, k, fig. 10, in the sand, which is to determine the place of the core, M, fig. 9, for the hole which is made in a separate pattern of well tempered clay or wet loam and dried. The upper flask, C, is then put on again, and loaded with weights ready for casting. In casting large cog-wheels, &c. flasks are often wanted as large as 20 feet on each side; to keep the sand from falling out, bars of wood are bolted across the flask, into which long nails are driven before it is filled, to keep the sand together. These large flasks are lifted by a crane.

III. Low-Calling is used for bulky articles, as cylinders, large pipes, boilers, cauldrons, &c. &c. We will begin by describing the manner of forming the mould for a large cylinder: A, fig. 11, is a beam of the building; B B is a spindle with three or four holes, d, e, through it, to fix an iron arm D in, at different heights by a nut; E E is a board, that can be firmly fixed between the bars D and E, by two clamps, G, H: the operation is begun by laying an iron ring L upon the ground, and adjusting it so as to be concentric to the spindle B; a cylinder of bricks and clay or wet loam, instead of mortar, is then built upon it, some inches less in diameter than the intended cylinder, for which this is to form a core; the bricks are firmly bound together with iron hoops, nailed wire, &c. and a fire is then lighted in it. When the mould used with the bricks is dry, a coating of loam is spread over it, and is smoothed by turning the board E E round it. This coat makes it of the proper size for the inside of the cylinder to be cast, and is called the core of the mould; another cylinder is built, plastered, and smoothed in the same way, except that no hoops are used, where the diameter is the same as the outside of the cylinder to be cast; when it is finished, it is covered with charcoal ground with water like paint, laid on with a brush; and a thin coating of loam is laid on; this is bound round with hoops, and to these, four hoops are fixed to lift it by; thick coat of loam and hair is then laid over it. When all these are dry, a man gets into the cylinder, and with a small pick pulls down all the bricks in the inside cylinder, and then with a trowel cuts away all the loam, leaving the inside of the external cylinder (which is called the mould) quite smooth; this is effected by the coat of charcoal, which prevents the two coats of loam from adhering together.

A deep pit is now dug, in some convenient part of the foundry, into which the core is let down by a crane; an apparatus, shown in fig. 12, is used for lifting it to the crane, A B D E is a wrought-iron cross, the arms of which are strengthened by ties going through the ring F, by which it is hooked to the crane-ropes or chain; on each of the four cross-bars, a ring with a hook, a, b, c, d, is loosely fitted; to these hooks ropes which pass through the hooks on the mould are fastened, in the core these ropes go round the flutes, i.e., of the ring L, fig. 11. The mould can always be made to hang perpendicularly, by slinging the hooks, a, b, c, d, nearer or farther from the center of the cross. When the core is let down in the pit, the mould is let down over it by the same means, and when they are adjusted, the sand is thrown in, and rammed round, about half the height; a flat cover of dried loam is then put on the top of the mould and core, and round pieces of wood are put in the holes which had before been made in the cover for pouring the metal in at. Theburying of the mould is then completed: when it is all levelled. The picks which keep open the holes for the metal are carefully pulled out, and small ditches made from the furnace to them, ready for casting.

Fig. 13, shows the method of making the mould for an air-vessel (see our article Pump); the core, A, is built of bricks, plastered with loam and turned by the machine, fig. 11, as before described; the edge of the board, E E, being cut to the proper curve; another is then built of the same size and form as the outside of the vessel to be cast, with a projecting ring or flaunch at the bottom; this, after being turned, is painted with charcoal, and the mould made upon it as in the last case; it is plain, that from the shape of the core the mould cannot be lifted off, nor can a man readily get in to take out the bricks as in the case of a cylinder; the mould must therefore be fawn in half, B G, with a fine saw, to get it off; it is then put together again round the core A, and the crack is plastered upon with loam. To describe the more complicated cases of this kind of Casting, as the nozzles or valve-boxes and pipes of steam-engines, &c. &c. would far exceed our limits.

Casting of gold, silver, or copper, in plates. See Coining.

Casting, in Foundry, &c. Wood is said to be cast or warped, when, either by its drought or moisture, or the drought or moisture of the air, or other accident, it shrinks or shrivels; in prejudice to its flatness or flatness.

Casting of lead on cloth, is the filling of a frame or mould covered with a cloth and linen over it, to call the lead into very fine sheets.

Casting of lead on sand, is done by means of a large frame or trough nearly full of sand, which is made perfectly level, and imprinted with any device from moulds pressed down in the sand: the lead is then turned out of the kettle into a receiver or trough, and poured on the sand, whilst two persons slide a gauge or lath, of such thickness as to leave a space between it and the sand answering to the substance of the lead, along the edges of the frame; the surplus runs into refiners or channels made in the sand. See Casting, in Foundry.

The goldsmiths use the bone of the cuttle-fish, to mould and cast their letters works of gold and silver; that bone, when dried, being reducible to a kind of a fine powder, very susceptible of all impressions.

Casting in lead, or platter, is the filling with fine liquid platter a mould that had been taken in pieces from off a flat or other piece of sculpture, and run together again. There are two things to be observed with regard to the mould: the first, that it be well leaked with oil before the platter be run, to prevent its sticking; the second, that each piece whereof it consists has a packthread, to draw it off the more easily when the work is dry. See Cast.

Casting of metal, of letters, belts, figures, &c. See Foundry.

Casting, in respect of Medals. See Medals.

Casting, in Rural Economy, the operation of throwing a horse down. It is done as follows: having brought him upon some even ground that is smooth and soft, or into the barn upon soft straw, take a long rope, double it, and cast a knot a yard from the bow; put the bow upon his neck, and the double rope betwixt his fore legs, about his hinder patterns, and under his fetlocks: when you have done this, slip the ends of the rope underneath the bow of his neck, and draw them quick, and they will overthrow him; then make the ends fall, and hold them down his head. This practice is necessary upon many occasions, when operations are to be performed on horses.

Casting, in Steamship, the motion of a ship in rolling off, so as to bring the direction of the wind on either side of the ship, after it had blown for some time right a-head. This term is particularly applied to a ship when her anchor firt
A first lookens from the ground, when she is about to depart from any place where she had anchored; and as it is proba-
ble the had been at anchor with her head to windward, it is
evident she must turn it off, so as to fill the sails before she
can advance in her course, which operation is called casting.
Hence, she is said to cast the right way, or the wrong way.

Casting-net, a sort of fishing-net, so called because it is
to be cast or thrown out, which when exactly done, nothing
escapes it, but walls; and everything within its extent, is
brought away.

Casting a point of traverse, among Seamen, signifies the
marking down on a chart the point of the compass any
place bears from you; or finding what point of the com-
pass the ship bears at any instant, or what way the ship has
made.

Casting of timber-work. See Casings.
CASTIGNE, in Geography, a town of Italy, in the
duchy of Milan; 8 miles S.W. of Milan.—Also, a town of
Italy, in the Lodiens; 9 miles S.E. of Lodi.
CASTLE, Casellum, in Ancient Writers, denotes a town
or village surrounded with a ditch and wall, furnished with
towers at intervals, and guarded by a body of troops.
The word is originally Latin, casellum, a diminutive of
castellum.

Casellum originally seems to have signified a smaller fort,
for a little garrison. Though Suetonius uses the word
where the fortification was large enough to contain a co-
hort.
The casella, according to Vegetius, were often like
towns, built in the borders of the empire, and where there
were confidant guards, and fences against the enemy.
Hordley takes them for much the same with what were
otherwise denominated fortifications. See Castella.

CASTLE, or CASTLE-reef, is also an appellation given
by the country people in the north to the Roman casella,
as distinguished from the casella platvs, which they usually
call chelsers. Hordley represents this as an useful criterion,
whereby to discover, or distinguishing, a Roman camp or fla-
tion.

CASTLE, in a modern sense, is a place fortified either by
nature or art, in a city or country, to keep the people in
their duty, or to resist an enemy. In the more extensive
interpretation of the word, it includes the various methods
of embattlement, see (Casigmation; ) but in its stricter
meaning, it is usually applied to buildings walled with stone,
and intended for residence as well as for defence.

Few branches of historical research have been so little at-
tended to as that which relates to Military Architecture.
Castles, indeed, such as we now see them, were of later in-
troduction to the world. Whether we may rank them with
the accommodations of life brought by the crusaders from the
East, is doubtful: but thus much seems tolerably cer-
tain, that it was in France, England, Germany, Switzerland,
and Savoy, that the system of casemate fort previ-

d. In Italy, till the Normans got possession of Naples
and Sicily, castles were comparatively few. And we may
at least date their general adoption in Europe with the feu-
dal fyltem.

The early British fortifications seem to have been little more
than mere intrenchments of earth. Cæsar, however, pen-
etrated not far enough to know the true nature of the Brit-
ish fortresses; and in his work, "De Bello Gallico," (lib.
v. s. 17;) has given only the description of a lowland camp.
In all parts of England there is a vast number of strong in-
trenchments of a very peculiar kind, situated chiefly on the
tops of natural hills, and which can be attributed to none
of the different people who have ever dwelt in the adjacent
country, but the ancient Britons. That they may have

been used at different times, and occupied upon emergen-
cies by the subsequent inhabitants of the island, is no more
than probable; but there are many, and undoubted reason,
for deeming them the strong holds and bastilles of the ab-
original letters, where they lodged their wives, formed
their garrisons, and made their land. That the Brutes
were accustomed to fortify such places, we have the au-
thority of Tacitus, who, describing the strong holds formed
and related to by Caesar, says, Time montum ar-

dis, et quia elementum accedebatur, in monte nulli
falsa pretium."

(Ann. lib. xii. § 13.) One of these en-
trenchments will make a formidable appearance on a moun-
tain hanging over the vale of Nenniworth, in Huntingdon, called
Med-Arthur.

1 But their situation being so high that they
could have no supply of water except from the clouds,
they were often liable to be untenable for a considerable
time together.

One of the most important of these fortresses in our own
country, is the Herefordshire beacon, situated on a spot
that could not but be an object of the utmost attention to the
original inhabitants of those territories, which afterwards
were deemed distinctly England and Wales, from the very
division here formed. It is on the summit of one of the
highest of the Malvern hills, and is known by the name ju-
mentioncd It has been by turns attributed to the Ro-

mans, the Saxons, and the Danes, but its construction as a
strong hold it seems to have been designed as a fort for the whole
adjacent country or any emergency. Another of these for-
tresses is at Bruff in Staffordshire; has been described by
Mr. Pennant; (Journey from Chester, p. 47,) and exactly
answers the account of Tacitus. It is on the summit of a hill, is
surrounded by two deep ditches, and has a rampart formed of stone.

Other instances are adduced by Mr. Pennant in his "Tour in Wales," and by Mr. King in the first volume of the "Monumenta Antiqua:" but a stronger
instance than all perhaps is given by Mr. Gough in the Ad-

ditions to Camden, (vol. ii. p. 423;) who shews that the
true Caer Caradoc, the very fortresses alluded to in the en-
trence we have quoted, which if not the royal castle of Carata-
sus, fums to have been at least his strong hold, was in Shrop-
shire, two miles north of Craven, and three from Cooxal, being
a large camp, three times long as it is broad, on the point of
a hill, accessible only one way, and defended on the north side
by very deep double ditches, in the solid rock: whilist on the east, the Rec преправ the ground renders it im-

pregnable. On the south it has only one ditch, for the
sake reason: and the principal entrance is on the west side,
foiced with double works; whilist on the south-west it is
even fenced with treble works. The most extraordinary,
however, of all these kinds of fortresses is situated in Caer-
narvonshire, called Tre'r Cari, or the town of fortresses.

The plan and elevation of this ancient strong hold and abode
is given by Mr. Pennant in his "Tour in Wales," (vol. ii. p.
206;) On the accessible side it was defended by three rude
walls of stone; the upper ones being lofty, about fifteen
feet high, and sixteen broad; exhibiting a grand and exten-
sive front. The space on the top is an irregular area;
but the whole is filled with cells; some round, and some oval,
and some also oblong or square. Several of the round ones
were fifteen feet in diameter; which brings to mind the
houses of the ancient Gauls described by Strabo; and of
those that were oblong, there was at least one even thirty
feet in length. Of the fame kind of fortresses were Pen-
maen-Mawr, in Caernarvonshire, Watton Cragg, in Lanca-
shire, Old Oswestry, in Shropshire; the irregular encamp-
ment of Maiden Castle high Dorcheffter; and probably Old
Saram, whose character was nio new modelled by the Romans.
Mr. King, (Monumenta Antiqua, vol. i. p. 63;) considers
the dens in the mountains, and the thickets of Scripture, as strong holds or hill-fortresses of the kind described. When Samson had made a great slaughter of the Philistines, we are told he went and built up on top of the rock Elan; where we find afterwards, three thousand men of Judah went up to confer with him. That hill-fortresses were used in the earliest ages there can be little doubt. The Frisians, when their land was invaded by Jabin, the king of Canaan, in consequence of an exhortation from Deborah the prophetess, assembled to make their stand upon mount Tabor. Among the Indians of South America, strong holds of a similar nature to those of Britain have been frequently discovered. (Uloa. Voyage to South America, i. 503, 504.) And a very curious influence of the attack and surrender of one in Sojhdiana, in All, in the time of Alexander the Great, is related by Quintus Curtius, (lib. vii. chap. xi.) The anecdote is worth the reference of the reader.

The British mode of warfare appears to have received but little alteration from the introduction of Roman tactics. Till finally subdued, their princes showed abilities both in the command of armies and in the conduct of a war; they chose their ground judiciously; formed able plans of active operation; and avoided themselves of all the advantages of local knowledge: but to the fortresses described, if we may rely on the testimonies of our ancient writers, they did not very frequently retire. Their deficiencies both in the attack, the construction, and the defence of such places, must have been very obvious even to themselves; and as they delighted to live, so they usually chose to fight in open plains. Their impatient courage, and their aversion from labour, made them unable to endure the delays and fatigues of defending or besieging the castles of their time; and they often reproached the Romans with cowardice for raising such solid works about their camps and flattons. (See Boaccia's famous speech to her army in Xiphilin, ex Dion in Nerone.)

Of the Roman military works in this country, they were for the greater part temporary; many, however, were stationary forts; and some few, to the retention of which the greatest importance was attached, became walled castles.

Caesar, in the work already quoted. (De Bell. Gall. i. vii.), describes one of his camps as fortified very much in the manner of a walled city. A few of the Roman stations in our own country afford a pleasing light on the description; and, in short, such as were so surrounded, appear to have been the link of connection between the British earth-work and the feudal castle.

Richborough, Portchester, and Pevensey, are the three greatest fortresses the Romans have left us.

Richborough, the very earliest in order of time, is supposed to have been begun in the year 43, in the reign of Claudius; but not to have been completed till 205, under the direction of the emperor Severus. There are in this distinguished fortress, says Mr. King (Munimenta Antiqua, ii. 8.) still plainly to be traced all the principal parts of one of the very greatest and most perfect of the stationary camps. The upper division for the general and chief officers; and the lower division for the legion. In the former the Praetorium with its parade; and the Sacellum or small temple for depositing the exvions. In the walls too are the traces of the four great gates; the decuman, the praetorian, and the two porticos. The great courtes of stone, with which the wall is formed, are separated from each other by alternate layers, composed entirely of a double course of bricks each; as in the walls of Verulam, Silchester, and other of our Roman towns.

The Roman remains at Portchester are not perhaps so clearly to be traced; since, having been constantly used as a fortress in succeeding ages, it has received wall and extremely various additions; and presents us with specimens of military architecture in almost every period from the Normans to the time of queen Elizabeth.

Similar alterations, to those first mentioned, have given so strong a turn to the general character of Pevensey, that its real era has been sometimes doubted; though portions of the Roman wall, as well as the Decuman gate, may be easily and accurately traced.

Here too it may not be irrelevant to observe that the castle at Colchester, in Essex, has been sometimes taken for a Roman fortress. And this not only because it has many of the same sort of walls which are found in Roman walls, but because they are laid in the same manner, with bonds. Though if the building is examined with attention, there may be traced in almost every part evident marks either of the later Saxon or Norman workmanship: and though many of the walls which are used in it may have been gathered from the remains of Roman buildings, the greater part appears to have been made on purpose. (See the Archaeologia, vol. iv. p. 33.)

That in the Roman times, however, there must have been many other such walled stations as those at Richborough, Portchester, and Pevensey, there can be little doubt. The Saxons, in the course of their long wars with the Britons, may be fairly supposed to have destroyed many of the fortifications which had been thus erected: and after their final settlement they neglected to repair those which remained, or to build many of their own. By these means the country became open and defended; which greatly facilitated the incursions of the Danes, who met with little obstruction from fortified places. That there was, however, something like a castle at Bamberough in Northumberland, we have the concurrent testimony of historians (Matth. of Wilmsh. p. 193. sub ann. 547. Sax. Chronicle, p. 19. Roger. Hoved. p. 238. B. Bede l. iii. c. vi. 12.) a castle at Castle, in Devonshire, is said to have existed in the days of Edgar (Gough's Add. to Camden, i. 49. King's Monumenta Antiqua, iii. 293.) Portchester castle during this period, probably, retained its designation. And Mr. King (Musim. Antiq. iii. 211.) has taken considerable pains to prove that the fortresses at Carlston in Derbyshire is of as high antiquity.

Alfred the Great, however, seems to have been the first of our princes with whom the building of castles became an object of national policy. Though, if Asser's authority may be received, they were not exactly what the reader at the first mention of their name might take them for; since they were composed not only of stone but of wood. (Afsler de Reb. gentis Alfredi, p. 17. 18.) Eilfca, too, his daughter, governess of Mercia, who seems to have been the only person in the kingdom who properly complied with the commands, and imitated the example of her illustrious father, and who inherited more of the wisdom and spirit of Alfred than any of his children, not only followed his steps by fighting many battles, but built not less than eight castles, in the space of three years, to check their incursions. (Hen. Hunt. Hist. p. 264.) A still more remarkable instance of the knowledge of castle-building at a short period subsequent to this, may be found in William of Malmsbury (c. vi.) When he mentions the rebuilding of Exeter by Athelstan, who died in 941, "Utrem ignem illam," says the historian, "quam contaminans gentes repurgio defecaverat, terribus munivit, muro ex quadrata lapidibus cinciat." And from the few remains of the fortifications of this period we find that the walls precisely answer Malmsbury's description. They were faced with these four-square stones both within and without, and the intermediate space, between the facings, was filled up with rubble or rough flint stones mixed together with a strong and
and permanent cement. It is to this period too that the most judicious of our writers have referred the castle at
Colchester which has been already mentioned. Its form is
four-square, flanked at the four corners with strong
towers, and it is about two hundred and twenty-four yards in cir-
cumference on the outside, all projections and windings in-
cluded; the four sides nearly facing the four cardinal
points. Some have even gone so far as to call this venerable ruin
British; others, as we have already said, have attributed it
with a greater share of plausibility to the Romans; but
Camden and our better writers acribe it to Edward the
elder, who repaired the walls and re-erected the town in the
beginning of the 10th century.

Still, however, the paucity of strong posts in the island
during every period of the Anglo-Saxon history may be
constantly observed. And it is more than probable that to
this defect we may attribute the defeat of Harold; since it
became necessary that all should be rallied upon the issue
of a sanguinary battle. The conqueror, himself, was evidently
fable that the want of fortified places in England had greatly
facilitated his conquest, and might, at any time, also
facilitate his expulsion. He therefore made all possible haste
to remedy the defect, by building magnificent and strong castles in all the towns within the royal demesne. "Wi-
lam," says Matthew Paris, "excelled all his predecessors in
building castles, and greatly harafted his subjects and vaftals
with these works." (Matthew Paris, Hist. p. 8. col. 2.)

All his ears, barons, and even prelates, imitated his ex-
ample; and it was the first care of every one who received
the grant of an estate from the crown, to build a castle upon
it for his defence and residence. The disputes about the
fiefdom, in the following reigns, kept up this spirit for
building great and strong castles. William Rufus was still
a greater builder than his father; and Henry I. was not
idle in adding to their number. "William Rufus," says
Henry Knighton (col. 2373.) was much addicted to build-
ing royal castles and castles, as the castles of Dover,
Windlor, Norwich, Exeter, the palace of Westminster,
and many others, testify; nor was there any king of Eng-
land before him that erected so many, and such noble ed-
ifices.

Though of one or two of these William Rufus was only
the improver. But the rage for building castles never
prevailed so much in any period of the English history as in
the turbulent reign of Stephen, between 1135 and 1154.
In this reign, says the writer of the Saxon chronicle (Chron.
Sax. p. 238. every one who was able, built a castle: so that
the poor people were worn out with the toil of these build-
ings, and the whole kingdom was covered with castles.
And this last expression will hardly appear too strong, when
we are informed, that besides all the castles before that time
in England, no fewer than eleven hundred and fifteen were
raised from the foundation in the short space of nineteen years.
(Rad. de Dicto, col. 528.) Stephen, says Holinhed (vol.
iii. fid. 50.) began to repent himself; although too late,
for that he had granted licence to so many of his subjeets
to build castles within their own grounds.

An art, Dr. Henry observes, (Histroy of Britain, vol. vi.
p. 188 8vo.) to much practised as architecture was in this
period, must have been much improved. That it really was
so, will appear from the following very brief description of
the most common form and structure of a royal castle, or of
that of a great earl, baron, or prelate in this period; and
as these castles served both for residence and defence, this
description will serve both for an account of the domestic
and military architecture of those times, which cannot well be
separated.

The situation of the castles of the Anglo-Norman kings
and barons was most commonly on an eminence, near
a river; a situation on several accounts eligible. The whole
site of the castle (which was frequently of great extent and
irregular figure) was surrounded by a deep and broad ditch,
sometimes filled with water, and sometimes dry, called the
vafta. Before the great gate was an outwork, called a bar-
on, or a counternial, which was a strong and high wall, with
turrets upon it, designed for the defence of the gate and
draughtwork. On the inside of the ditch stood the wall of
the castle, about eight or ten feet thick, and between twen-
ty and thirty feet high, with a parapet, and a kind of em-
braques, called crenellae, on the top. On this wall at proper
distance, square towers of two or three stories high were
built, which served for lodging some of the principal officers
of the proprietor of the castle, and for other purposes; and
on the inside were erected lodgings for the common servants
or retainers, granaries, bafe-houses, and other necessary
offices. On the top of this wall, and on the flat roofs of
these buildings, stood the defenders of the castle, when it
was besieged, and from thence discharged arrows, darts, and
stones, on the besiegers. The great gate of the castle stood
in the course of this wall, and was strongly fortified with a
tower on each side, and rooms over the passage, which was
closed with thick folding-doors of oak, often plated with
iron, and with an iron portcullis or grate let down from
above. Within this outward wall was a large open space
or court, called, in the largest and most perfect castles, the
outer bailey, or baillium, in which stood commonly a church
or chapel. On the inside of this outer bailey was another
ditch, wall, gate, and towers, inclining the inner bailey or
court, within which the chief tower or keep was built.
This was a very large square fabric, four or five stories high,
having small windows in prodigious thick walls, which ren-
dered the apartments within it dark and gloomy. This
great tower was the palace of the prince, prelate or baron,
to whom the castle belonged, and the residence of the con-
stable or governor. Under ground were dismal dark vaults,
for the confinement of prisoners, which made it sometimes be
called the dungeon. In this building also was the great hall,
in which the owner dispelled his hospitality, by entertaining
his numerous friends and followers. At one end of the
great halls of castles, palaces and monasteries, there was a
place raised a little above the rest of the floor called the
del, where the chief table stood, at which persons of the
highest rank dined. Though there were unquestionably
great variations in the structure of castles and palaces in this
period, yet the most perfect and magnificent of them seem
to have been constructed on the above plan. Such, to give
one example, was the famous castle of Bedford, as appears
from the following account of the manner in which it was
taken by Henry III., A. D. 1224, from Matthew Paris.
(Hist. Angl. p. 221, 222.) The castle was taken by four
assaults. "In the first, was taken the barbacan; in the se-
cond, the outer ballia; at the third attack, the wall by the
old tower was thrown down by the miners, where, with
great danger, they poliffeed themselves of the inner ballia,
through a chink; at the fourth assault, the miners set fire to
the tower, so that the smoke burst out, and the tower itself
was cloven to that degree, as to shew visibly some broad
chinks; whereupon the enemy surrendered."

As Britain abounded in this period in fortified towns and
castles, much of the art of war of course confeiled in defend-
ing and assaulting strong places. For the various kinds of
engines which were used both in the attack and the defence
of these, we shall refer the reader to Artillery; observing
only that a knowledge of the application of them in this
period may be obtained from the relation of the siege of
Exeter.
Exeter castle by king Stephen in the year 1136. (See the Gesta Regum Stephani apud Dugd., p. 934.) It is perhaps the most consummate specimen of the military skill of that age with which we are acquainted. And it may be enough to observe, that after this siege had lasted three months, and king Stephen had expended upon it in machines, arms, and other things, no less than 15,000 marks, equal in efficacy to 150,000 pounds of our money, the besieged were obliged to surrender for want of water. (Henry's Hist. of Britain, vol. vi. p. 317.)

Berkley, which was originally founded in the reign of Stephen, is one of the few remains we are now permitted of, of an ancient feudal castle. But the changes which almost all these buildings have undergone infolio, and in towers may be judged of by those which have taken place at Berkley. The buildings within the innermost only of the three gates are said to have been the work of Henry II. when duke of Normandy; while the two outermost, with all the buildings belonging to them, except the keep, are referred to the latter end of the reign of Henry II. and to those of the second and third Edwards. The hall and the two chapels are of the latter period; and the great kitchen, adjoining to the keep, was of the work of Henry VII.

Among the castles which Mr. King has endeavoured to appropriate to the early Norman period, are those of Nottingham, Lincoln, and Clifford's tower at York, all erected by the Conqueror. (Arch. vol. vi. p. 525.) The remains of all these, he observes, fully illustrate the Norman mode of constructing such edifices. "Tick-hill, in the neighborhood of Doncaster, appears to have been another of these castles (ibid. 269.); and Pontefract bespeaks a Norman design, with rude and imperfect alterations. All of these appear to have been erected upon artificial mounts, and nearly cover the whole area of the summit of the respective hills on which they are situated.

Tuambridge castle, in Kent, built by Richard de Clare about the time of William Rufus, is mentioned by Mr. King as a specimen of the later Norman structures; and he has been very accurate in his description of it. (Ibid. 270.) Gundolph, who directed the building of the Tower of London in 1275, and the castle at Rochester, he describes to have introduced a great many judicious alterations, and not only to have increased the security but the magnificence of our military piles; and observes that the castle at Rochester is a complete specimen of all that he effected. Newark, which Mr. King afterwards mentions, is an instance of a prelate's castle in the reign of Stephen; and the keep of Knarleborough, of the time of Henry III., completes the specimen it may be proper to mention of the irregular style of castle building which prevailed during the interval between the Norman conquest and the middle of the thirteenth century.

To these succeeded the magnificent piles of Edward I. more convenient and more florid, and containing not only many towers, but great halls, and sometimes even religious houses. The florid style of military architecture in this period was displayed in the castles of Caernarvon, Conway, and Caerphilly; and it is singular to observe that many of our more ancient castles were then increased with additions in the same florid style. After the age of Edward I. we find another kind of castle introduced, approaching nearer to the idea of modern palaces. The florid style was that at Windsor, built by Edward III. who employed William of Wykeham as his architect. This convenient and enlarged style of building was soon imitated, on a lesser scale, by the nobles of the realm; and two remarkable instances, wherein convenience and magnificence were singularly blended at this period, may be found in the castles of Harewood and Spofford in Yorkshire. The improvements at Kenilworth afford another instance of the great enlargement which our castles during this age were accustomed to receive; and Newbury in Cumberland is another of the best specimens that can probably be referred to. Calonor in Norfolk affords the style of Henry VIth's reign. It was built by John Pattof, who died in 1430.

To these venerable piles succeeded the castellated houses; mansions adorned with turrets, and battlements; but utterly incapable of defence, except against a rude mob, armed with clubs and hoes, on whom the gates might be flung; yet still mansions almost cut off, devoid of all real elegance, or comfortable convenience, and fitted only to entertain a herd of retainers wallowing in licentiousness. At the same time, however, they discover marks of economy and good management, which enabled their hospitable lords to support such rude revels, and to keep up their state, even better than many of their more refined successors. Of these buildings one of the most perfect and most curious, now remaining, is Haddon house in Derbyshire; castellated and embattled, in all the apparent forms of regular defence; but really without the least means of resistance in its original construction. The description Mr. King has given of it (Arch. vi. 537.) is, however, too long to be extracted, and too curious to be abridged.

After this kind of building, the magnificent quadrangular houses of the reign of Henry VIII. succeeded; of which the most beautiful and genuine models perhaps were those of Cowdray in Sussex, and Penshurst the seat of the Sidney family, in Kent.

Without referring to the flattery buildings of Elizabeth's reign, it may be enough to say that heredit is the history of the English castle. The block houses of Calnhot, Hurst, Sandrown, Sandgate, and South Sea, are the last instances of such buildings ever intended for a land, and seem strongly to mark the revolution which has taken place in our defensive system of war.

The total change in military tactics brought about by the invention of gunpowder and artillery, the more settled state of the nation, Scotland becoming part of the dominions of the kings of England, the respectable footing of our navy, whose wooden walls secure us from invasions, and the abolition of the feudal system, all conspired to render castles of little use or consequence, as fortresses: so the great improvements in arts and sciences, and their constant attendant, the increase of luxury, made our nobility and gentry build themselves more pleasant and airy dwellings; relinquishing the ancient dreary mansions of their forefathers, where the enjoyment of light and air was sacrificed to the consideration of strength; and whose remote rooms, according to our modern, refined notions, have more the appearance of galls and dungeons for prisoners, than apartments for the reception of a rich and powerful baron.

However, in the reign of Charles I., a little before the breaking out of the civil war, some inquiry into the state of these buildings seems to have taken place; for on the 23d of January, 1636, a commissary was instituted, appointing lieutenant colonel Francis Coningsby, commissary general of and for all the castles and fortifications in England and Wales, with an allowance of 150. a day to be paid out of the cheques and defalcations that should be made by him from time to time; or, in default thereof, out of the Treasury. Whether this office was really instituted for the purpose of scrutinizing into the state of these fortresses, as foreseeing the events which afterwards happened; or whether it
CASTLE.

it was only formed to gratify some favourite, does not appear. During the troubles of that reign, some ancient castles were pulled down and defended, several of which, particularly Corte castle in Dorsetshire, were afterwards destroyed, by order of the parliament; for that period, they have been abandoned to the mercy of time, weather, and the more unifying hands of avaricious men. The last has proved the most destructive; many of these monuments of ancient magnificence having been by them demolished for the sake of the materials: by which the country has been deprived of those remains of antiquity so essential, in the eyes of foreigners, to the dignity of a nation; and which, if rightly considered, tended to inspire the beholder with a love for the now happy establishment; by leading him to compare the present with those times when such buildings were erected;—times when this unhappy kingdom was distracted by interline wars, when the ion was armed against the father, and brother slaughtered brother; when the laws, honour, and property of the wretched inhabitants depended on the nod of an arbitrary king, or were subject to the more tyrannical and capricious wills of lawless and foreign barons.  

The few castles existing in the Saxon time, were, probably, on occasion of war, or invasions, garrisoned by the national militia, and at other times slightly guarded by the domestics of the princes or great personages who resided in them; but after the conquest, when all the castles were converted into baronies, held by knights' service, Castle-guard, coming under that denomination, was among the duties to which particular tenants were liable. From these services the bishops and abbots, who till the time of the Normans had held their lands in frank almoine, or free alms, were, by this new regulation, not exempted; they were not indeed, like the laity, obliged to personal service, it being sufficient that they provided fit and able persons to officiate in their stead. This was, however, at first vigorously opposed by Anfehn, archbishop of Canterbury; who, being obliged to find some knights to attend king William Rufus in his wars in Wales, complained of it as an innovation and infringement of the rights and immunities of the church.  

It was no uncommon thing for the Conqueror, and the kings of those days, to grant all these men of approved fidelity and valour, on condition that they should perform Castle-guard, with a certain number of men, for some specified time; and sometimes they were likewise bound by their tenures to keep in repair some tower or bulwark, as was the case at Dover castle.  

In process of time these services were commuted for annual rents. Sometimes styled ward-penny, and wayte-fee, but commonly castle-guard-rents; payable on fixed days, under prodigious penalties called fur-fizes. At Rochefort, if a man failed in the payment of his rent of castle-guard, on the feast of St. Andrew, his debt was doubled every tide, during the time for which the payment was delayed. These were afterwards restrained by an act of parliament made in the reign of king Henry VIII., and finally annihilated with the tenures by knights' service, in the time of Charles II. Such castles as were private property, were guarded either by mercenary soldiers, or the tenants of the lord or owner.  

Castles which belonged to the crown, or fell to it either by forfeiture or escheat, (circumstances that frequently happened in the distracted reigns of the feudal times), were generally committed to the custody of some trusty person, who seems to have been indifferently styled governor or constable. Sometimes also they were put into the possession of the sheriff of the county, who often converted them into prisons. That officer was then accountable to the exchequer, for the farm or produce of the lands belonging to the places entrusted to his care, as well as all other profits: he was likewise, in case of war or invasion, obliged to virtual and furnish them with munition out of the stores of his county; to which he was directed by acts of privy seal.  

Variety of these writs, temp. Edw. III., may be seen in Madden's History of the exchequer; and it appears from the same authority, that the barons of the exchequer were sometimes appointed to survey these castles, and the state of the buildings and works carrying on therein. (See Grote's Preface to the Antiquities of England and Wales.)

CASTLE, in Sea Language, denotes in elevation on the deck of a vessel; or a part of the deck, fore and aft, raised above the rest.

CASTLE, Fore, Castello di prora, &c. See Fore-castle.

CASTLE, Hind, Castello di poppa. See Pop.

CASTLE-Ward, or CASTLE-Guard, Castello d'armo, or Warden Caffie, an impetration laid on such as dwell within a certain compass about any castle, towards the maintenance of those who watch and ward the castle, which fee.

The word is sometimes also used for the circuit itself, inhabited by such as are subject to this service.

CASTLE, Water, a piece of hydraulic work finished with one or more fronts of building, with seeming windows and the like, containing a reservoir which gives play to cafades, &c. Or, a water-castle may be defined a receptacle of the public water furnished by an aqueduct, or otherwise, in which are inclosed the cocks of several water-pipes with a little bason; contrived to distribute and fend it to different parts.

The castella of the ancient aqueducts are still visible at Rome, though half ruined. They are lined with a durable kind of cement, which, according to Pliny, forbad them to harden the bones themselves. It is made of lime flacked in wine, and beaten up with hog's grease, and the juice of figs or pitch.

Modern writers on hydraulics treat of the laws of the efflux of water out of castella into pipes, canals, &c. Signior Poleni has a treatise express on castles, or reservoirs, whereby the waters of rivers are derived, the sides of which castles are made converging.

CASTLEBAR, in Geography, a market and post town of the county of Mayo, Ireland, which is also the seat town, and the most considerable in the county, having been much enlarged within a few years, in consequence of the judicious encouragement given by the proprietor, lord Lucan, to the iron manufacture and other trades. Agriculture also has improved in the neighbourhood. This town is situated on the river which runs from the lake of Castlbar, west of the town, to Lough Conn. In these and the other lakes of the neighbourhood, besides salmon and other fish, is found that kind of trout called the gillaroo, of which there is an account in the Philosphical Transactions, vol. xxiv. p. 316. 310. It is remarkable for a great thickness of stomach, which bears some resemblance to the gizzard of birds, and which is brought to table as a delicacy, under the name of gizzard. Mr. Pennant (Brit. Zoology, vol. iii.) does not think it a distinct species, but a variety occasioned by the nature of the waters, or of the food. Castlbar is a corporate town, which, before the union, lent two members to the house of commons, but has now lost that privilege. It has a barrack, and in the rebellion was a military station. When the French, under general Humbert landed at Kilkilla, in 1798, they surprized the troops at Castlbar, and taking possession of the town, held it for nine days, when
CASTLE-DERMOT, a small port town of the county of Killkenny, Ireland. remarkable for its mines of what is usually called Kilkenney coal. To the north of the town, there is a large iron mine, and a number of small iron mines, which are worked by the inhabitants. The town is situated near the point where the Monamore River enters the sea, and is about five miles from the sea. It is a thriving place, with a large trade in coal and other minerals.

CASTLE-COMER, a small port town of the county of Monmouth, England. It is situated on the north bank of the Monomor River, and is about three miles from the sea. The town is noted for its coal mines, and is a thriving place. There are also several iron mines in the vicinity, which are worked by the inhabitants.

CASTLE-CARY, an ancient city, in the county of Somerset, England. It is situated on the banks of the Monomor River, and is about five miles from the sea. The town is a centre of the coal and iron mining industry, and is noted for its beautiful scenery.

CASTLE-BELLINGHAM, a small port town of the county of Louth, Ireland. It is situated on the north bank of the Monamore River, and is about five miles from the sea. The town is noted for its coal mines, and is a thriving place. There are also several iron mines in the vicinity, which are worked by the inhabitants.

CASTLE-BLKENEY, a small port town of the county of Galway, Ireland. It is situated on the north bank of the Monamore River, and is about five miles from the sea. The town is noted for its coal mines, and is a thriving place. There are also several iron mines in the vicinity, which are worked by the inhabitants.

CASTLE-BLAYNEY, a small port town of the county of Meath, Ireland. It is situated on the north bank of the Monamore River, and is about five miles from the sea. The town is noted for its coal mines, and is a thriving place. There are also several iron mines in the vicinity, which are worked by the inhabitants.

CASTLE-CARY, an ancient city, in the county of Somerset, England. It is situated on the banks of the Monomor River, and is about five miles from the sea. The town is a centre of the coal and iron mining industry, and is noted for its beautiful scenery.
of Killdare, Ireland. St. Diarmit is said to have founded a priory here in A.D. 500, from which it got part of its name. During many centuries it was called Trilic-Dermot, for what reason is not known; but of later years it has been called Castle-Dermot, from a castle belonging to the Fitzgeralds, of which there is not a trace remaining. It was plundered by the Danes in the 9th century, taken and sacked by Edward Bruce in 1316, and taken by col. Reynolds for Cromwell in 1650. Since which times its walls have moulderd to decay; but though the gates have been destroyed, the names of two of them are still preserved. The town is situated on a flat, and surrounded with a fine level country for several miles. Of the ruins, the old church, in part of which service is still performed, with the round tower adjoining, and two crofles, are supposed to be of the 10th century. The round tower is useful as a halfryan, which seems to counteract the opinion, that this was their original deftlon. The remains of a Franciscan abbey, founded by one of the Fitzgeralds about the year 1500, show it to have been magnificent; particularly one of its windows, two of the ailes, and some of the oclon pillars, which still preserve the outlines of ancient grandeur and elegance. A parliament is said to have been held here in 1577; certainly there was such an assembly under the earl of Killdare, lord deputy in Augufl 1599, when a tax was laid on, and some regulations adopted, which however did not probably extend beyond the English pale. The present inn is generally understood to be a part of the building in which the parliament was held. The first charter school established in Ireland was in this town, A.D. 1734, for forty boys. See Charter Schools. The number of houses in 1793 was 103, of which 63 were of lime and flone, and the rest cobble. There is no manufacture, but some little buffets are occasioned by the great postal road from Dublin to Cork passing through it. It is 34 Irish miles S.W. from Dublin. N. lat. 52° 54'. W. long. 6° 52'. Philos. Survey of South of Ireland, Anthol. Hibert, &c.

CASTLE-DURROW. See Durrow.

CASTLE-FINN, a small poft town of the county of Donegal, situated on the river Finn, which is navigable for veffels of 14 tons from Derry to this place. It is 43 miles S.W. from Lifford, and 104 N.W. from Dublin. N. lat. 54° 48'. W. long. 7° 27'.

CASTLE-GUARD, a mount near Ardee, county of Louth, Ireland, which has been generally considered as a Danish fort. It is entirely artificial, and accompanied with a double ditch and vallum. It is now all planted with wood, and looks very romantic. The perpendicular height of the mount from the bed of its foundation is near 50 feet, and the depth of the main trench between 30 and 40. The circumference of the top is not less than 140; and round the foundation upwards of 600 feet. There appear to have been, from foundations yet remaining, two concentric octon-gonal buildings upon the summit of it. One seems to have been a fort of tower or castle; the other a kind of breaft-work, or gallery, by way of parapet or battlements. The use as well as origin of this, and similar mounts, has been disputed.

CASTLEHAVEN, James Toucet, lord Audley, earl of, in Biography, a nobleman who lived in the reigns of Charles I. and II. He entered into the service of the con- federated Catholics in Ireland, A. D. 1641, and had a command in their service, and afterwards under the king, till the redution of Ireland by Cromwell. In 1681, and again with some little alteration in 1684, he published "Memoirs concerning the Wars of Ireland," which occasioned much controversy, and the first edition, together with lord Angle-
Bride. It has a good market for poultry, and has large fairs. The inhabitants are about 1000, and the town seems capable of great improvement. The ruin of the castle, the residence of the earls of Barrymore, which was burned a few years ago, makes a conspicuous appearance at a great distance. Here are a neat church of modern structure, and the ruins of an abbey, the possessors of which being affiged to the first earl of Cork, were left by him "to his daughter Barrymore, to buy her gloves and pins."

CASTLETON, a small town of the county of Kerry, Ireland, situated on the river Main, or Mang, which is deep enough for vessels of 50 tons or upwards. The castle here formerly guarded the pafs over the river, which divided the earl of Desmond's possessions from those of Macarthy, and was given up to queen Elizabeth by the last earl. Though now in ruins, a confidérable is still appointed to guard it, who has some land and privileges annexed to the office. The town is very poor, which is in some measure occasioned by the badness of the harbor. There is a bar across the mouth of the entrance, and a spit of land on each side of the channel, and there are no land marks which a stranger can easily understand. It is repreffed as too large in most old maps, and has been erroneously spoken of as very fale. Near Castlemain there is a fpa, which, according to Smith, contains sulphur and iron. It is 15½ miles S.W. from Dublin. N. lat. 5° 10'. W. long. 9° 35'. Smith's Kerry, McKenzie, &c.

CASTLE-MARTYR, a market and poft town of the county of Cork, Ireland, belonging to the earl of Shannon, who resides there, and has paid great attention to its improvement, and to that of the adjoining country. It is a neat, well built town, and well watered by a canal, or artificial river, which furnards lord Shannon's demeane, as well as the town. Mr. Young mentions the combing business being carried on extensively in Cable-martyr, but this trade has since declined in every part of the country. There is a charter school for 40 boys, to the support of which lord Shannon has largely contributed. This town was made a borough in 1663, and continued to fend two members to parliament till deprived of this privilege by the union. It is 17 miles E. from Cork, on the road to Youghal, and 123 miles S.W. from Dublin. N. lat. 51° 55' 30". W. long. 8° 3'. Smith's Cork, Young, &c.

CASTLE-POLLARD, a market and poft town of the county of Watermeath, Ireland, which is 46 miles N.W. from Dublin, and 11 miles N. from Mullingar.

CASTLERA, a market and poft town of the county of Roscommon, Ireland, which is 84 miles W. by N. from Dublin, and 134 from Roscommon.

CASTLEAGH, a barony of the county of Down, Ireland, so called from a castle, the ruins of which are about two miles S.E. of Belfast bridge.

CASTLE-RISING, is an ancient, though at present a very inconfiderable borough, of Norfolk, England. It was formerly a fport of some confequence, and from its strong caftle obtained many privileges; but the fire has deferted the town, its haven is cloathed up with sand, and the caftle is in ruins. The latter, with the town, is fettled on an eminence. The caftle was built by William d'Albini, earl of Arundel and Sufle, in the time of Henry I. Three of its towers were defended and maintained by the lords Humflanton, Wutton, and R'don: and to support their men, they had a power given them by a fituate of Edward III. to take provision of the circumjacent villages, paying for it within 40 days. Caftle-rising is 100 miles N. from London, and is an ancient borough by prefcription. The burghers were formerly at fifty, but these are now reduced to two persons; who poffefs the privilege of fending two members to parliament, and each alternately assumes the mayoralty of the town. In the vicinity of Caftle-rising is a large chace, which poftesses the privileges of a forel. The church of this town is a large ancient pile, built in the conventual form, with an ornamented weft front. The rector has the privilege of proving all wills made in the parish, and also retains some other privileges, refulting from the caftles of the caftle. The markets here are defcontinued, and the town is reduced to 40 houfes and 254 inhabitants. Bloomefield's History of Norfolk.

CASTLETON, in Antiquity, a very ancient edifice in Derbyshire, leated on the summit of an almost inaccessible rock, impeding at a great height over the mouth of one of the most horrid and august caverns which nature ever formed. Mr. King, in the Archeologia (vol. vi.) has very particularly described this curious remnant of antiquity. This prefents a large niche in the wall of one of the apartments, with a fingular kind of canopy or ornament at the top, fuppoifed to have been the "idol-cell," or little idolatrous chapel in Pagan times. This suppoifion feems to receive fome support, with refpeft to Caftleton, from certain small idols which were dug up a few years ago in the neighbourhood. See CASTLE.

CASTLETON, in Geography, a townhip and river of America, in Rutland county, and State of Vermont, 20 miles S.E. of Mount Independence, at Ticonderoga. Lake Bombazon is chiefly in this town, and tranfmits its waters into Caftleton river; which, rifing in Pittsford, paffes through this town in a south-weftherly courfe, and falls into Pultney river, in the town of Fairhaven, a little below col. Lyon's iron-works. Fort Warner founds in this town. The number of inhabitants is 823.

CASTLE-TOWN, the name of a town in the isle of Man, which belongs to Great Britain, and is provincially connected with the county of Cumberland. It is the residence of the principal officers of the government, and the seat of the Manks' parliament. The houfes are fettled on the opposite fides of a small creek, that opens into a rocky and dangerous bay; the difficulty of entering which injures, in a certain degree, the commerce of the town. The streets are spacious and regular, and the houfes are mostly neat and uniform. In the centre of the town is Cable-Ruhen, a folid and magnificent structure of free-stone, erected on a rock, and confidered as the chief fortes in the ifland. According to the Manks' traditions, it was built in the year 960, by the Danish prince, Guttred, who lies obfcurely buried within its walls. The figure of the caftle is irregular, and by fome writers faid to bear a great refeemble to Elineur, in Denmark. The free glaces which furrounds it is fuppofed to have been built by cardinal Wolfey. The free-work of the keep and feveral interior porfions of the building are nearly as entire as when firft erected, but the other parts have been repaired, as the caftle has been severall times fefeged. In the keep is a deep dungeon for prisoners, who muft have been flowered into it by ropes, as there are no fteps to defend by. In this town is a neat and ancient chapel, which was erected between the years 1658 and 1701, and paid for out of the ecclefiaftical revenues. The firft ftone was laid, and the chapel consecrated, by the good bishop Wilfon in 1658. Here is also a free-school, which was eftablihcd by bishop Barrow, about 1666. The school-houfe was formerly a chapel dedicated to St. Mary, as early as the year 1230. The courts of chancery and common law are held in this town. Here are about 500 houfes.
houses. Feltham's Tour through the Isle of Man, 8vo. 1703.

Castle-town. A small town, or rather village, at the western extremity of the county of Cork, Ireland, sometimes called Castle-Defnot; it is opposite to the island of Deerhaven, and affords a facility to vessels lying in that harbour. It is 186 miles S.W. from Dublin. N. lat. 51° 17'. W. long. 9° 49'.

Castle-town, a market town of America, in Richmond county, Staten island, New York, which contains 807 inhabitants, including 114 slaves. Of its inhabitants 114 are electors.

Castle-town Delvin, a market and post town of the county of Westmeath, Ireland, the site and name of which gave rise to the surrounding barony. It is 35 miles N.W. from Dublin, and 103 miles from Mullingar.

Castle-town Rochest, a market and post-town of the county of Cork, Ireland, thus called from a castle that was formerly the seat of the lords Rochest. It is on the river Avon, 115 miles S.W. from Dublin, and about 22 miles from Cork.

Castle-townSEND, a small town of the county of Cork, Ireland, on the bay of Castle-haven. There is a good fishery off this bay, and in it are excellent oysters. It is 150 miles from Dublin, and 35 from Cork.

Castle-Wellow, formerly Called-Vellin, a market and post-town of the county of Down, Ireland, pleasantly situated on the side of a small lake of the same name. It is 65 miles N. from Dublin, and 5 W. from Downpatrick.

Castola, in Ancient Geography, a town of Italy, in Etruria, which was taken by the confidant Publius.

Castoli Campa, a mountain of Asia Minor, in the Doride, according to Xenophon.

Castologe, a people of Gaul, placed by Pliny in the vicinity of the Atrebati.

Castolus, a town of Lydia, in Asia Minor, belonging to the Dorians, called by the Lydians Castoli.

Castor, in Astronomie, a moiety of the constellation Gemini; called also Apollo. — Also, a star in this constellation, whose latitude for the year 1700, according to Hevelius, was 10° 4' 23" N.; and its longitude 16° 4' 14" of Cancer. It is also called Rafalgenus, Apollis, Apellis, Apellis, and Aetner.

Castor, in Commerce. See Beaver, and Castor in Zoology.

Castor, or Caistor, in Geography, a small town of Lincolnshire, England; having a weekly market on Monday, and three fairs annually. This place is said to have been a Roman station; but the only memorials of its fortifications and military character are the traces of an encampment on an eminence, at a place called Castle-hill, near the town. Several springs issues from this eminence, and supply the inhabitants with excellent water. The parish church is a fine old edifice, supposed to have been built out of the ruins of the castle. The latter structure is called Thong-castle, and, according to some of our old chronicles, was built by Hengist the Saxon; but this is very improbable, as the most eminent historians have endeavoured to prove, and with every degree of probability, that Hengist never penetrated so far north into England. Among the singular tenures of this country may be noticed one which belongs to this town. A proprietor of an estate in this neighbourhood holds it upon the condition of sending an agent every Palm Sunday to the north porch of the church, where he is enjoined to crack or smack, what is here called, a horrid-gad, (a whip) three times while the clergyman is reading the first lesson. He then proceeds into the church, palls the pulpit, and performs many other truly ridiculous tricks:—a proof of the fully and superfluous of the age when this ceremony was instituted. Castor is 136 miles N. from London; and contains 202 houses, with 361 inhabitants.

Castor's River, a river of Newfoundland island, which discharges itself in the harbour of St. John's. Its size is considerable for 15 miles from the sea.

Castor, Coffaeum, in the Materia Medica. This substance, which may be called an animal gum resin, is the inguinal gland of the beaver, (erroneously supposed by the ancients to be the testicle,) which has long been in use in medicine, though now but rarely. See Castor in Zoology.

The castor is brought over in roundish but flattened lumps, covered with a tough membranous film. Castor is a brittle, reddish-brown, irritable substance, of a pungent, bitter, unpleasant taste, and an intensely strong and peculiar smell, disagreeable to most organs.

By far the best castor comes from Russia, and is in rounder and harder molasses, and its smell is stronger and more diffusive. The ordinary fort, which is in flattened molasses, is imported from Canada, and other parts of North America.

The odorous and more active part of castor is taken up by alcohol, water alone dissolving chiefly the bitter extractive part; but the scent of castor is readily imparted to any liquor with which it is digested. Water diluted from castor becomes strongly impregnated with the flavour, but long keeping and heat dissipate it.

The only preparation of castor in common use is the simple tincture, made in the proportion of an ounce to a pint of the spirit. The dose is about a dram, and it is supposed to palls the present strong nerve and anti-hysterical properties, and with this view is often combined with valerian, afteetia, or tonics.

By the analysis of Bullion la Grange, it appears to consist of a mucilage, a bitter extract, a resin, and an essential oil, in which all the odorous principle seems chiefly to reside, and a fatty crystalline matter much resembling adipocere, or the similar matter contained in biliary calculi.

Castor Oil, Oleum Ricini. The seed of the Palma Christi (Ricinus communis,) is a whitish kernel enclosed in a brown acid husk, which, taken entire, excites very violent vomiting and purging. These seeds contain a large quantity of a mild nearly inipid oil, of which from a third to a fourth of the weight may be extracted, and is the common castor oil of the shops. It is imported largely from the West Indies, where it forms one of the commonest domestic medicines for most occasions.

Genuine castor oil is very thick and viscous, of a light amber or straw colour, with scarcely any smell or taste. It becomes beautifully transparent by sublimation, and a quantity of mucilage falls slowly to the bottom of the vessel.

The oil is prepared in two different ways, either by simple expression, without previous preparation, or by decoction. For the latter method, the nuts are beaten in deep wooden mortars, and then thrown into iron boilers filled with water, and slowly brought to a boiling heat with constant stirring. The oil rises as a feath at the top, which is simply strained and bottled. According to Dr. Wright, (Medical Journal for 1787,) the oil thus prepared is much milder than that obtained by pressure, on account of the mucilaginous and acid part which the compression forces out of the nut and mixes with the oil.

The very mild and finest Jamaica oil is very limpid, and nearly colourless, and has scarcely more taste and smell than fine olive oil, and its effects are proportionately milder.

Castor oil is one of the most valuable of all the purgative medicines which we possess. In the dose of about half an ounce to three quarters for an adult, it usually operates by itself.
CASTOR.

ool, speedily and mildly, with but little griping, though the measure of effect must be much determined by the parity and finesness of the oil, the strong-smelling and conjurer kind often producing some unaccords in the bowels. On account of its general mildness, it is the medicine most commonly selected for puerperal women, and those of very delicate habits, and children. Its virtues are also deftively extolled in the feverish inflammatory and spasmodic affections of the bowels, in enteritis, colic, pétition, &c. The oil, when taken unmixed, always passes through, in part undecomposed, and may be seen in the feces.

The exhibition of the oil is often attended with some difficulty, particularly as oil is so little used for culinary purposes, that most persons have an aversion to the sensation of any kind of oil clinging to the mouth and fauces. In general, if the mouth is previously well moistened with peppermint-water, or any other strong-tailed agreeable liquor, and the oil, floating unmixed in a cup of water, be swallowed quickly in large mouthfuls, it is not felt in the mouth, and all difficult is avoided. But when this cannot be well-managed, and the difficulties of the unmixed oil is insuperable, it may be readily made into an emulsion with yolk of egg and sugar, and any aromatic, which completely covers all the flight maulous taste which the raw oil leaves in the throat. In this way, however, the purgative power must be diminished, that is, all that depends on the mere oil, which is not inconsiderable, since an equal quantity of foulad oil will prove, in some degree, purgative, apparently by its mere lubricating effect.

The very frequent use of this oil is rather of late date in this country; though it has been long known and reported to in particular cases.

Where the oil is naturally unusually acid, or has become so by long keeping, it has been proposed to agitate it with warm water, with a view of dissolving out part of the acrid mucilage; a method which will probably succed to a certain degree.

CASTOR, the Beaver, in Zoology, a genus of quadrupeds which have the front teeth in the upper jaw truncated, and hollowed in a transverse angle; those in the lower jaw transverse at the tips; grinders four in each jaw: tail long, defurred, and scaly: clavicles perfect, or collar bones in the skeleton.

Two species only of this genus are at present known, Castor Fiber, the common beaver; and the Chili beaver, Castor Huicidius, or as it is called by the natives of Chili, Guillerino.

CASTOR Fiber has an ovate, flat, and naked tail, by which character it is immediately distinguished from the other species, the tail of which is long, of a lanceolate form, and hairy. The colour of this animal is susceptible of considerable variation in different climates: most commonly it is of a reddish or chesnut brown. In northern countries they are dusky, and even sometimis of an intense black; but those latter are rare. Others are grey, cream-coloured, or white; and in facets have occurred, in which those of a light-colour have been spotted with brown or black. Those of Canada are chesnut, and among the Illinois, they are yellow, or olivaceous brown.

The beaver is a native of the northern parts of Europe, Asia, and North America, abounding most in cold regions, and becoming gradually less common towards the south. In America they are found from the 50th degree of north latitude to beyond the 60th. In ancient times the beaver was a more general inhabitant of Europe than it is at present, especially in France, Spain, Italy, Greece, and Egypt, where they are now scarcely ever observed, and in Britain they have been wholly extirpated for some centuries. That it was formerly an indigenous inhabitant of this country is certain upon the credit of the most authentic records. The latest accounts we have of them is in Gildas Cambrensis, who travelled through Wales in 1889; he gives a brief history of their manners; and adds, that in his time they were only found in the Tywi river. Several pools of water in the northern parts of the Cambrian principality still bear the name of Lyn yr ongaf, the pool (or lake) of beavers. There are two, if not more, of the pools amid the wilds of the Snowdonian mountains that bear this name to the present day; there is one in particular in the vale of Nant Francon near Beddgelert, in Caernarvonshire, and another in the river Conway, a few miles above Llanrwst. These were evidently the haunts of beavers. It is however believed that the beaver was uncommon in Britain before the tenth century, for by the laws of Howel Dda (Leges Waliar) the price of the beaver's skin (Crum Llybaid) was estimated at one pence: a great sum in those days.

Beavers, when full-grown, are nearly three feet in length from the tip of the nose to the insertion of the tail; the tail itself measures almost twelve inches long; and the weight of the whole animal is from fifty to sixty pounds. Of all quadrupeds the beaver is considered as possessing the greatest degree of natural sagacity in confounding its habituations, though in other respects it is believed inferior to many. If we consider this animal in a state of nature (see Baffon) or rather in its dappled and solitary state, we shall find that his internal qualities are not superior to other animals; he has neither the genius of a dog, the sagacity of an elephant, nor the cunning of a fox, and he is rather remarkable for external singularities than for any apparent superiority of internal qualities. The beaver is the only animal that has a flat, oval tail, covered with scales, which serves as a rudder to direct his course in the water; the only one that has the hind-feet webbed, and the toes of his fore-feet separate, which he uses to convey food to his mouth; the only one which resembles a land animal in his fore-parts, and approaches the nature of an aquatic one in the posterior; in short, he forms the same shade between quadrupeds and fishes, as the bat forms between quadrupeds and birds. But these singularities would be rather defects than perfections, if the beaver did not derive from this conformation peculiar advantages adapted to its mode of life, which render it superior to all other animals. It is generally allowed, says this writer, in another place, that the beaver, far from having a superiority over other animals, seems to be inferior to many of them in his merely individual qualities, and this fact he affirms he was able to confirm, by having had a young beaver, which was sent him from Canada alive, in his possession for more than a twelve-mouth. This animal is mild, peaceable, and familiar; it was rather inclined to be gloomy and melancholy, had no violent or vehement passions, its movements were slow; it made few efforts except to gain its liberty, which it frequently attempted by gnawing the gate of its prison, but without violence or precipitation. In other respect it seemed to be perfectly indifferent; forming no attachments, and being as little inclined to offend as please. He was inferior to the dog in the relative qualities which might make him approach to man: he appeared neither formed to serve, command, or even to associate with any species but his own; his talents were repressed by solitude, and it seemed only by society with his own kind, those talents could be brought into action. When alone he had little industry, few tricks, and not sufficient skill to avoid the most obvious snares. Far from attacking any other animal, he had fearlessly the art to defend himself; always preferring flight to combat; he retired only when driven to an extremity, and then bit very hard
hard with his teeth. Such traits of the manners of this animal, in a state of caprice, are singular. We are not, however, satisfied that the observations of Buffon will apply to the beaver generally; in one respect he is evidently incorrect; we are affixed by the belief that the beaver may be easily tamed. M. Klein tells us he kept a beaver in a cellar, and when, without suspecting him, one would go in quelled of him as a dog would search for his master; Raimon pronounces decisively to the same effect; he observes, in his travels, that he has seen beavers that would go out to fish, and bring the prey home to their marks, nay, that they would even follow men and dogs, go with them into the water, jump into the water, and come up again with the fish; and M. Gmelin affirms that he saw a beaver in Siberia, which had been reared in the house, who would wander to a considerable distance, sometimes returning with a female whom he would not depart alone after the season of love.

Authors have stated that the beaver, being an aquatic animal, could not live solely on land; an opinion which Buffon endeavours to prove erroneous; he observes that the young beaver before mentioned when taken to the water was afraid of it, and refused to go in; when plunged into the basin there was a necessity to hold him there by force, though in a few minutes he became perfectly reconciled; afterwards, when left to his liberty, he would frequently return to it of himself, and even roll upon the dirt, or wet pavement. One day he escaped and defended by a flume-cafe into the subterraneous vaults in the royal garden, and swam a considerable time in the stagnant water at the bottom of them, yet no sooner did he perceive the light of the torches which were brought to search for him, than he returned, and suffered himself to be taken without the least resistance. He was familiar, not fatigued, and was sure to express his desire for something to eat from those he fancied table, which he signified by a small plaintive cry, and some gestures with his fore-paws; when he obtained a morsel he carried it off and concealed it, that he might eat it at his ease. He slept pretty often, and then laid on his belly. No food came amiss to him, meat excepted, which he refused either raw or dinned. It was remarkable, that he gnawed everything within his reach, informing that it had been found necessary to line with tine barrel in which he had been brought from Canada.

The favourite reforts of the beaver are retired woody situations on the borders of lakes, rivers, and other fresh waters, yet they are sometimes found on the sea shores near the influx of great rivers, where the waters are less saline than in the open sea.

According to Buffon, the beavers begin to assemble in the month of June or July, for the purpose of uniting into society. They arrive in numbers from all parts, and soon form a troop of two or three hundred. The place of rendezvous is generally the situation fixed for their establishment, and always on the banks of some water. If the waters be flat, and never rise above their ordinary level, as in lakes, the beaver makes no banks or dam; but in rivers or brooks, where the waters are subject to considerable risings and fallings, they construct a bank, and by this artifice form a pond, or piece of water, which remains always at the same height. The bank traverses the river from fore to aft, or from one bank to the other, like a sluice, and is often from eighty to a hundred feet long, by ten or twelve broad at the base. This pile, for animals of so small a size, appears to be enormous, and supposes an incredible labour; but the solidity with which the work is constructed is still more attesting than its magnitude. The part of the river where they erect this bank is generally shallow. If they find on the margin a large tree, which can be made to fall into the water, they begin by cutting it down, to form the principal part of their work. This tree is often thicker than the body of a man. By gnawing the foot of the tree with their four cutting teeth, they accomplish their purpose in very short time, and always make the tree fall across the river. They next cut the branches from the trunk, to its root level. These operations are performed by the whole community. Several beavers are employed in gnawing the foot of the tree, and others in lopping off the branches after it has fallen. Others at the same time traverse the banks of the river, and cut down smaller trees from the size of a man's leg to that of his thigh. These they dress and cut to a certain length to make flakes of them, and fill them by land to the margin of the river, and then by water to the place where the building is carrying on. These piles they link down, and interweave the branches with the larger flakes. This operation implies the vanishing of many difficulties; for if from the flakes, and to put them in a situation nearly perpendicular, some of the beams must elevate with their teeth the thick ends against the margin of the river, or against the cross-tree, while others plunge to the bottom and dig holes with their fore feet to receive the points that they may land on end. While some are labouring in this manner, others bring earth, which they plash with their fore feet, and transport it in such quantities, that they fill with it all the intervals between the piles. These piles consist of several rows of flakes, of equal height all placed opposite to each other, and extend from one bank of the river to the other. The flakes facing the under part of the river are placed perpendicularly; but the part of the work rises upwards to inflame the precipice of the bank, so that the bank which is ten or twelve feet wide at the base, is reduced to two or three at the top. It has therefore not only the necessary thickness and solidity, but the most advantageous form for supporting the weight of the water, for preventing its influence, and for repelling its efforts. Near the top or thinnest part of the bank they make two or three sloping holes to allow the surface water to escape, and those they enlarge or contract, according as the river rises or falls; and when any breaches are made in the bank by floods or violent inundations they know how to repair them as soon as the water subsides.—It would be superfluous after this account of their public works, to give a detail of their particular operations, were it not necessary in a history of these animals to mention every fact, and were not the first great structure made with a view to render their smaller habitations more commodious. These cabins, or houses, are built upon piles near the margin of the pond, and have two openings, the one for going to the land, and the other for throwing themselves into the water. The form of the edifices is either oval or round, some of them larger and some less, varying from four or five, to eight or ten feet in diameter. Some of them consist of three or four stories, and their walls are about two feet thick, raised perpendicularly upon planks, or plain flakes, which serve both for foundations and floors to their houses. When they conlit of but one story, the walls rise perpendicularly only a few feet, afterwards assume a curved form, and terminate in a dome, or vault, which forms an roof for a roof. They are built with amazing solidity, and neatly plastered both without and within. They are impervious to rain, and repel the most impetuous winds. The partitions are covered with a kind of flucco, as nicely plastered as if it had been executed by the hands of man. In the application of this mortar they taills serve for trowels, and their feet for plastering. They employ different materials, as wood, stone, and a kind of sandy earth, which
which is not subject to dissolution in water. The wood they use is almost all the light and tender kinds, as alder, poplar, and willow, which grow generally on the banks of rivers, and are more easily harked, cut, and transported, than the heavier and more solid species of timber. When they once attack a tree, they never abandon it till they cut it down and carry it off. They always begin the operation of cutting at a foot or a foot and a half above the ground. They labour in a fitting posture; and besides the convenience of this situation, they enjoy the pleasure of gnawing perpetually the bark and wood, which are most agreeable to their taste; for they prefer fresh bark and tender wood to most of their ordinary aliment. Of these provisions they lay up as far as possible, to supply them during the winter; but they are not fond of dry wood, and make occasional excursions during the winter season for fresh provisions in the forests. It is in the water, or near their habitations, that they embellish their magazines. Each cabin has its own magazine, proportioned to the number of its inhabitants, who have all a common right to the store, and never palliate their neighbours. Some villages are composed of 20 or 25 cabins, but such establishments are rare; and the common republic seldom exceeds 10 or 12 families, each of which has its own quarter of the village, its own magazine, and its separate habitation. They will not allow strangers to settle in their neighbourhood. The smallest cabins contain two, four, or six; and the largest eighteen, twenty, or it is said even sometimes thirty beavers. They are almost always equally paired, there being the same number of females as of males. Thus, on a moderate computation, the society is often composed of 150 or 200, which all at first laboured jointly in raising the great public building, and afterwards in select tribes or companies, in making particular habitations. In this society, however numerous, an universal peace is maintained. Their union is cemented by common labours; and it is rendered perpetual by mutual convenience, and the abundance of provisions which they amass and confine together. Moderate appetites, a simple table, an averton against blood and carnage, divest them of the idea of rapine and war. They enjoy every possible good. Friends to each other, if they have some foreign enemies, they know how to avoid them. When danger approaches, they acquiesce one another by striking their tails on the surface of the water, the noise of which is heard at a great distance, and refounds through all the vaults of their habitations. Each takes his part; some plunge into the lake, others concealed themselves within their walls, which are so firmly constructed that no animal will attempt to hurt through, or overturn them. These retreats are not only very safe, but neat and commodious. The floors are spread over with verdure; the branches of the box and fir serve them for carpets, upon which they permit not the slightest dirtiness. The window that faces the water answers for a balcony to receive the fresh air, and to bathe. During the greatest part of the day they sit on end, with their head and anterior parts of the body elevated, and their posterior parts immerged in the water. This window is made with caution, the aperture being sufficiently railed to prevent its being flopped up with the ice, which in the climates inhabited by the beaver is often two or three feet thick. When this happens, they close the window, cut obliquely the flake which supports it, and thus open a communication with the unfrozen water. This element is so necessary, or rather so agreeable to them, that they can seldom dispense with it. They often swim a long way under the ice, and it is then that they are most easily taken, by attacking the cabin on one hand, and at the same time watching at the hole made at some distance, where they are obliged to repair for the purpose of respiration. The continual habit of keeping their tail and posterior part in the water appears to have changed the nature of their flesh. That of their anterior parts, as far as the reins, has the taste and consistence of the flesh of land or air animals; but that of the tail and hinder parts has the colour and all other qualities of fish. The tail, which is a foot long, an inch thick, and five or six inches broad, is both an extremity or genuine portion of a fish attached to the body of a quadruped; it is entirely covered with scales, and with a skin perfectly similar to those of large fishes: they may be scraped off with a knife, and after falling, they leave an impression on the skin as is observable in fishes under similar circumstances.

The beavers assemble in the beginning of summer. They employ the months of July and August in the construction of their bank and cabins. In September they collect their provisions of bark and wood; and afterwards enjoy the fruits of their labour and foresight. At this season they couple, each as it is affirmed, fertilizing its mate; and abiding with her by choice rather than indigluing in a promiscuous intercourse with the rest of the females. Thus they pass the autumn and winter together, during which time they occasionally go out on excursions to bring in a supply of fresh bark, which they prefer to that, which, by remaining long in their magazine, has become dry or hard, or has been by accident moistened with water. The females are said to be pregnant for four months; they bring forth at the end of the winter, and generally produce two young, rarely three, or four, which half they seldom if ever exceed, and nature has provided the female with four teats for suckling its young. About the end of winter the females are left by the males, who retire to the country to enjoy the products of the spring. They may occasionally revisit their cabins, but never remain long in the same. The females continue in their cabins, and are occupied in nursing, protecting, and rearing their young, which at the end of a few weeks, are in a condition to follow their dams. The females now in their turns make frequent excursions, and recruit their strength with air, and fresh bark, and other herbage. Thus they pass the remainder of the summer till autumn, when the whole society again assembles. But even during the summer, while thus dispersed, should their banks or cabins be overthrown by inundations, they suddenly collect their forces, and repair the breaches which have been made. They are much more attached to some places than others, and have been observed to return every autumn, after their works have been repeatedly demolished to repair them, till harassed by this persecution, and weakened by the loss of several of their troop, they have with one consent deserted it, and retired to some more secure and less frequented neighbourhood.

Winter is the season principally allotted for hunting the beaver, as it is only then their fur is in perfection; and when, after their dwellings are demolished, a number of them are taken, their society, it is said, is never restored, but those which escape become houflefs wanderers. Their genius is overcome by apprehension, and they never more attempt to exert it, but conceal themselves in holes under ground, and reduced to the condition of other animals they lead a timid life, employing themselves only to satisfy their immediate wants, and they retain no longer those qualities which they so eminently poifefs in their fociall state. These are the unacquainted beavers mentioned by authors, who live solitary, and instead of constructing cabins, or vaulted and plastered receptacles, only form holes for their dwellings in the banks of rivers. These are commonly termed terrier beavers, and their fur is considered as far less valuable than that of the beavers.
beavers which herd together in societies. All the European beavers are solitary: it is only in the wild and scarcely habitable tracts of the northern regions these animals can be sufficiently secure from the intrusion of man, to form the commodious habitations already mentioned.

Many writers, not content with ascribing to the beaver social manners, and evident talents for architecture, have attributed to them general ideas of policy and government. They have asserted that when their society is formed, they reduce travellers and strangers of their own species into slavery; that they employ them in carrying their clay and wood; that they treat in the same manner the idle who will not, and the old who cannot, work; that is, throw them upon their backs, and use them as so many vehicles to carry their materials: that they never assemble in an even number, in order that they may have in all their deliberations a conflicting vote; that each tribe has its chief; and that they have cantinels established for the public security. Eblian, and others of the ancients have pretended further, that, when closely pursued by the huntsman, they would fly short, and tear off the secretory glands of caltor to satisfy the cupidity of the hunter; and when thus mutilated would present themselves to obtain mercy. Such reports are absurd, and are completely exploded by modern observers.

The fur of the beaver is more beautiful and thick than that of the otter; it is composed of two sorts of hair; the one, short and bushy, soft as down, and impenetrable to the water, immediately covers the skin; the other, longer, bril- liant, and shining, but thinner, serves as an upper coat, and defends the former from foot and dull. The latter is of little value, it is only the first that is used in our manufactories. The use of its fur in the hat manufactories is sufficiently well known; attempts have been also made in France to weave the hair of beavers with the Segovian wool, but which in the event was found to form a cloth of no very excellent quality. The blackest furs are generally thickest, and consequently most esteemed; nor is the fur of the solitary beavers equal to that of those who live in society. Thse animals, like all other quadrupeds, shed their hair in summer; and therefore the furs of such as are taken in that season are of little value; they are called the flage-beavers, being those which the Indians kill on their flages or journies, and are esteemed the worst skins. Beaver skins are also distinguished by the name of coat beaver, and parchment beaver, by traders; the first is that which is worn by the Indians as coverlets, and the other is so named because the lower side refellies parchment.

In hunting beavers, the favages most commonly either shoot them or take them in traps. In the first instance they always proceed against the wind, for the beavers are shy, quick in hearing, and of a keen scent. The beavers are generally taken by shooting while they are at work, or when on shore feeding on the poplar bark. If they hear any noise when at work, they immediately jump into the water, and continue there some time; and when they rise, it is at a distance from the place where they plunged in. The traps laid for them are nothing more than poplar flicks laid in a path near the water; which when the beaver begins to feed upon they cause a large log of wood to fall on their necks, which is put in motion by their moving the flicks, and of course requires an ingenion contrivance. The favages generally prefer the latter mode of capture, because it does not damage their skins. In the winter they take the beaver in another manner; they break the ice in two places at a distance from the cabins, the one behind the other; after which they take away the broken ice with a kind of racket, the better to observe where to place the flaks. To these they flatten nets, which have large meshes, and are sometimes 18 or 20 yards in length. When these are fixed, they proceed to demolish the house, and turn in a dog, which terrifying the beaver, he dives into the water, where he is soon entangled in the net and taken.

The skin of the beaver form a prodigious article of commerce; many thousands are annually imported by the Hudson's Bay company into England from North America, which is the principal though not the only source from which our beaver skins are obtained; Ruffia furnishes a vast number. But besides the fur, which is a valuable article, the beaver affords a substance of considerable utility in medicine, the drug castor oil or caltor, which see. This substance is secreted in two large cellular glands situated near the genital organs and the anus. Each animal affords about two ounces of this substance, and it is common to both sexes. It is pretended by some that the beavers extract this liquid by pressing the bladders with the feet; that it gives them an appetite when disgutted with food, and that the favages to entrapp them wet the fnares with it. Others affirm, however, with greater probability, that the animal employs this oily substance to anoint its fur and render it more impervious to the water. The American favages are faid to obtain an oil from the tail of the beaver, which they apply as a topical remedy for different complaints. The flesh is seldom eaten; though fat and delicate to appearance, it is extremely bitter and unpalatable. Beavers are faid to couple when a twelve month old, and it has been hence inferred that the beaver does not commonly live to the age of 20 years as some writers affirm. The American beavers feed principally on the magnolia glauca, fraxina americana, and a variety of roots, among which they seem to prefer those of the acorus calamus, or calamus aromaticus; the poplar, asph, and birch are the favourite food of the European beavers.


Cauror huidelbrus differs from the former in having the tail long, lanceolate, and hairy; the fore feet lobed and the hind feet palmsed.

This is the guillino beaver of Pennant, and Chili beaver of later English writers. It is a singular animal, and appears to have been first described by Molina in his Natural History of Chili. This writer (to whom later authors seem principally indebted for their account of this animal) informs us that it inhabits the deep parts of the lakes and rivers of Chili; that it feeds principally on fish, and crabs; and does not construct any regular habitation like the common beaver; nor does it afford any of the embellishments of the same called caltor. The length is about three feet. The head is nearly square; the eyes small; the ears rounded and short, and the mouth ob- fuse; in each jaw are two sharp and strong cutting teeth, and the grinders like those of the other species of beaver. The body is very broad, and covered like the beaver with two sorts of hair, the undermof which is finer than that of the rabbit, and is in much demand with the manufacturers, being wrought into a kind of cloth which has the softness of

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of velvet, and is also used in the manufacture of hats. The color of this animal is cinnabrine above, and whitish on the belly. The toes of the fore feet are lobated, or bordered with a membrane, and the hind feet are webbed; the toes five in number on each foot. The tail is compressed, and is kibites distinguished from that of the common beaver in being lanceolate and hairy, a character by which the species may be easily known. This is represented as a bold, and even fierce animal, and as having the power of remaining for a considerable length of time under water. The female produces from two to three young at a birth.

The Zibethicus, or mink-rat, is arranged by some as a species of Castor; but as it appears more clearly to the rat tribe, recent naturalists refer it to the genus Mus. See Mus zibethicus.

**Castor and Pollux, in Astronomy. See Gemini.**

**Castor and Pollux, in Meteorology, a fiery meteor, which at sea appears sometimes flickering to a part of the ship, in form of one, two, or even three or four fire-balls: when one is seen alone, it is more properly called Helena; two are denominated Castor and Pollux, and sometimes Tyndarida.**

Castor and Pollux are called by the Spaniards, San Elmo; by the French, St. Elme, St. Nicholas, St. Clare, St. Helena; by the Italians, Ercole; by the Dutch, Vre Vuuren.

Castor and Pollux are commonly judged to portend a cessation of the storm, and a future calm; being rarely seen till the tempest is nigh spent. Helena alone portends ill, and indicates the fiercest part of the storm yet behind.

When the meteor flicks to the walls, yards, &c. they conclude, from the air's not having motion enough to diffuse this flame, that a profound calm is at hand; if it flutters about, it indicates a storm.

**Castor and Pollux, in Fabulous History, were two brothers, the sons of Tyndarus or Tyndarus, king of Sparta, by his wife Leda, and they had two filters, the famous Helena and Clytemnestra, the wife and murderer of Agamemnon. According to the fable, Jupiter had an amour with Leda, in the form of a swan, and she brought forth two eggs, each containing twins. From that impregnated by Jupiter proceeded Pollux and Helena, who were both immortal: from the other Castor and Clytemnestra, who being begotten by Tyndarus, were both mortal. They were all, however, called by the name "Tyndarida." These two brothers entered into an inviolable friendship; they accompanied the other noble youths of Greece in the expedition to Cuthus, and signalized themselves by their valor. The fable adds, that when Castor died, his brother Pollux, who was immortal, prayed to Jupiter that he might share his immortality with him; which being granted, they lived and died by turns, and being translated into the heavens, they formed the constellation Gemini. As they were distinguished by their courage, particularly in their contests with pirates, they received divine honours, and, cannon paid them peculiar devotion. Accordingly, the veil which covered Paul, (Acts xxvii. 11,) was called Dofcar, or Castor and Pollux, because their images were either carved or painted on the prow. There was besides some other deity on the stem, and these were regarded as the patrons and tutelary gods of the vessel.

A martial dance, called the "Pyrrhic," or "Caelorian" dance, was invented in honour of these deities, whom the Cephaleneus placed among the dii magni, and offered to them white lambs. The Romans also rendered them particular honours, on account of the assistance they are said to have given them in an engagement against the Latins; in which, appearing mounted on white horses, they turned the scale of victory in their favour, for which a temple was erected to them in the forum.

**CASTOREA, in Botany. Plum. See Duranta Plumeri.**

**CASTOREUM, in the Materia Medica. See Castor.**

**CASTORIA, in Geography, a lake of European Turkey, in the province of Macedonia, and also a town of the same name; 30 miles W. of Edessa. Also, a river of European Turkey, which empties itself into the lake which it gives name, in Macedonia; and the name is afterwards changed into Villitzer.**

**CASTORUM LACUS, in Ancient Geography, Castrorum templum, or Castrorum nemus, a place of Italy, 12 miles from Cremona, according to Tacitus; called Castoris lucus by Orofus, where Cecina, Vitellius's general, was defeated by the troops of Otho.**

**CAstra, the Latin term for a camp, has given name to a great number of places; some of the principal of which we shall mention: e.g., Caltra, a town of India, on this side of the Ganges, placed by Ptolemy in the country of the Saalacians; of place or town of Norica, in the Itin. of Anton.—A town of Macedonia, marked in Anton. Itm. on the route from Otranto to Constantinople, in passing by Macedonia, between Sciriana and Heraclea.—A place of Italy, N.E. of Terrigelo.—C. Alexandri, a place of Africa, in Marrarica; and also a place of Egypt near Pelusium.—C. Annibalis, a port of Italy, in Magna Grecia, on the peninsula formed by the gulfs Scilaceus and Tarentinus, according to Ptolemy.—C. Cacilla. Cacritas, a town of Spain, in Lusitania, S. of Rufliciana.—C. Cornelius, a place of Africa Proper, according to Ptolemy and Mela. It is called by Julius Caesar and Ptolemy, C. Cornelia; and is the place where Scipio Africanus first encamped when he landed in Africa. It occupied a tongue of land, called "Gallia," about 2 fadac broad, and was the most northern and rugged part of the promontory of Apollo, situates in Africa, N. of Carthage.—C. Cyri, the place where Cyrus encamped when he marched his army into Lydia, against Croesus, mentioned by Quintus Curtius and Arrian.—C. Delia, or Lelia, a place of Africa, near C. Cerestis and the river Bagadas, according to Mela.—C. Don, a place of Palæstine, between Ze- rah and Edhzaal, in the tribe of Dan, where the spirit of the Lord began to move Samuel. Judges xiii. 20. Josh. xix. 14.—Also, another place of Palestine, in the tribe of Judah, behind Kirjath-Jearim. Judges xviii. 12.—C. Expoloratorum, a place in the Ifle of Alitoun, mentioned in the second route of Antonine's Itinerary. If Bithium Bithium, (which fee) was really at Middakby, as Horsey renders probable, every circumstence leads us to fix the Caltra Explorationerum at Netherby, and the most at a small distance from it; for at the former there was a famous Roman town, and at the other an exploratory camp. Both these places are at a proper distance from Bithium Bithium on the one hand, and Lingualium on the other, and situated on the military way which led from the one to the other.—C. Felicitana, a place in the island of Sardina.—C. Galba, an episcopal see of Africa, in Numidia.—C. Genamis, a town of Spain, in the district of Hispalis, according to Ptolemy; which was tributary to the Romans.—C. Germoporum, a place of Africa, in Mauritania Cufariensis, according to Ptolemy; near a small river E. of the promontory of Apollo.—C. Harnbilahis, Castella, a place of Italy, in Brittanum, at a small distance N.E. of Scyllacrum. See C. Annibalis.—C. Herculis, a town of Germany, occupied, according to Ammianus Marcellinus, by the Romans. It was one of the few places on the Rhine, which Julian repaired; and was situated over against the
the place where Daunus opened a canal for discharging the
waters of the Rhune into the Illici.—C. Jula, a town of
Spain, placed by Pliny in Lusitanian.—C. Lupinarium, a
place of Egypt, in the Timbade.—C. Mavaria, a town of
Spain.—C. Munerum, a place of Asia, in Melopotamia, W.
of mount Sugarma.—C. Nova, a maritime place of Africa, in
Mauritania Cæsarea, marked in the Itinerary of Antonius
on the route from Cala to Rufaneum, between Tagis and Bollene.—C. Proserpina, the camp of Pollux, a place of Spain, in the vicinity of Ucelia, fortified
and garrisoned by Catull.—C. Praetoria, a place of Rome,
near the porta Viminalis. It was a kind of citadel, accordin
g to Pompy, where Tiberius assembled the praetorian co-
HORTS. It was enclosed by walls, ditches, and towers, and
had a temple, an arsenal, barracks, and barracks, &c.—C. Praetorium, a place of Africa, in Mauritania Cæsarea, built in the colony of Gilsa and Parthus Doria.—C. Praen, a place in Rhasia.—C. Scholion, an episcopal city of Addessar
Mauritania Cæsarea.—C. Tarac, a place in the vicinity of Kibone, a small town on the banks of the Aucus, in Dac-
ia.—C. Tiberium, a particular place of Egypt, in the vicinities of Memphis, according to Herodotus.—C. Vani, the
episcopal see in the patriarchate of Antioch, under the mi-
tropolis of Arzaratius.

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